LEAFLETS

OF

PHILIPPINE BOTANY

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ERRATA

P. 1153, l. 11 from bottom for Pilse read Pilze

P. 1154, l. 6 from top for superticialibus read superficialibus; correct the same on pages 1155, 1156 and 1158.

P. 1155, l. 8 from top for "et" read "ex"; correct the same on page 1156.

P. 1159, l. 11 from bottom for 34 read 3-4

P. 1169, l. 6 from top for rizoma read rhizoma

P. 1171, for "Vo. IV." read "Vol. IV."

P. 1191, l. 12 from top eliminate "held in manuscript"

P. 1191, l. 3 from bottom for *M. nervosum* read *M. venosum*; correct the same on page 1199.

P. 1197, l. 10 from top for *Diplycosia* read *Diplospora*

P. 1235, l. 12 from top for *F. antonii* read *F. antoniana*

P. 1236, l. 17 from bottom for *Elm.* read *Blm.*

P. 1237, l. 19 from bottom for *F. asperrima Miq.* read *F. asperrima Roxb.*

P. 1238, l. 3 from top for *gabella* read *glabella*

Pp. 1244 and 1373, l. 6 from top for *palawanense* read *palawanensis*

P. 1258, l. 14 from bottom for *F. adamsii* read *F. adami*

P. 1263, l. 9 from top add "*(Miq.) Elm.*" after *Ficus odorata*

P. 1263, l. 10 from bottom insert "it" between occasionally and becomes

P. 1265, l. 9 from bottom insert "is" between infrutescence and not

P. 1269, the sentence 'Named with pleasure after *Mr. H. Peabody*' should have been inserted on the preceding page

P. 1269, l. 14 from bottom for gobulose read globulose

P. 1290, l. 11 from top for anther read author

P. 1301, l. 4 from bottom for *casaeriaefolia* read *caseariaefolia*

P. 1310, l. 3 from bottom for collection read collecting

P. 1311, l. 16 from top for *N. sibuyanensis* read *N. graciliflora*

P. 1311, l. 16 from top for *Decaspermun grandiflora* read *Decaspermum grandiflorum*

P. 1322, l. 7 from top for "at flats" read "flats at"

P. 1389. l. 13 from bottom for *humulis* read *humilis*

P. 1449, l. 17 from top cut out the word "gravel"

LEAFLETS OF PHILIPPINE BOTANY

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Vol. IV. Manila, P. I., October 7, 1911. Art. 61.

NEW FERNS FROM SIBUYAN

BY

E. B. Copeland

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The island of Sibuyan is centrally situated in the Philippines, south of Luzon, east of Mindoro and north of Panay. It is for the larger part made up of the mountain mass of Gitinggiting, the summit of which has never been reached. *Mr. Elmer* has here collected about forty species, including several hitherto known from but one or two collections, and the novelties described below. The rarities are mostly species previously known only from Palauan.

CYATHEA Smith.

Cyathea latipinnula Copel. spec. nova.

Trunco teste *Elmer* 120 cm. alto, 10 cm. crasso, frondibus 180 cm. longis, stipitibus 60 cm. longis, basibus paleis brunneis vestitis, sursum spinosis; rhachibus spinulosis (pinnarum minute), paleis sordide brunneis biformibus sat deciduis vestitis; pinnis 45 cm. longis, ca. 20 cm. latis, truncato-acuminatis; pinnulis brevistipitatis, usque ad 4 cm. latis, acuminatis, deorsum pinnatis; pinnulis II infimis brevistipitatis et pinnatifidis,

medialibus contiguis adnatis, 5 mm. latis, subacutis, coriaceis, infra pallidis, costa deorsum paleis minutis pallidis bullatis vestita, lamina glabra; soris costalibus; indusio ut rudimento difficile detectu.

No. 12512, on windy ridge of Sibuyan Island, alt. 1400 m.

In appearance near *C. caudata* (*J. Sm.*), but with much broader pinnules; different from this and from *C. Mearnsii* in the double pubescence.

Cyathea (Alsophila) obliqua Copel. spec. nova.

Trunco teste *Elmer* gracile, 3 m. alto, 5 cm. crasso, cicatricibus foliarum ovato-ellipsoideis 25 mm. altis, stipitibus 60 cm. altis, basibus spinosis paleis pallidis vestitis; rhachibus brunneo-purpureis, nitidis, infra glabris, supra praecipue in sulce pubescentibus; pinnis stipitatis, acuminatis, 30-35 cm. longis, ca. 13 cm. latis; pinnulis longistipitatis, 5-7 cm. longis, vix 1 cm. latis, valde acuminatis, basi inaequalibus, inferne acute cuneatis, superne cuneato-truncatis, grosse serratis, costa deorsum minute paleacea sursum venisque sparsissime piliferis; soris medialibus, nudis.

No. 12354, on hillside of Sibuyan Island, alt. 600 m.

A species of the general alliance of *C. glabra* (*Blume*), very distinct however, and recognizable by the long-stalked and long-acuminate pinnules, serrate but not lobed.

Cyathea sibuyanensis Copel. spec. nova.

Trunco teste *Elmer* 7 cm. crasso, 5 m. alto, frondibus paucis, maximis 180 cm. longis, stipitibus 60 cm. longis, basibus paleis brunneis vestitis, pinnis medialibus maximis; rhachibus paleis minutis latis laceris et praecipue deorsum aliis linearibus ciliatis supra baseos caducis densissime vestitis, ob baseos palearum linearium deinde minute hispidis; pinnis stipitatis, maximis 35 cm. longis, 18 cm. latis, abrupte acuminatis; pinnulis inferioribus stipitatis; pinnulis ^{II} infimis stipitatis, 12 mm. longis, 6 mm. latis, fere ad costam in segmenta orbicularia pinnatifidis, sequentibus 15 mm. longis levitius incisis, cordatis, apice rotun-

datis, costis squamuliferis vel sursum minutius setiferis, lamina coriacea glabra, supina pagina nigra, prona pallida, venis furcatis; soris medialibus, indusio globoso, brunneo, persistente.

No. 12513, Mt. Giting-giting of Sibuyan Island, alt. 1450 m.

Group of *C. integra J. Sm.*, nearest *C. Robinsonii Copel.*, from which and from *C. philippinensis Baker* it differs essentially in the character of the pubescence, and in various minor details.

TECTARIA Cav.

Tectaria adenophora Copel. spec. vel nomen nova.

Sagenia rhizomate brevirepente, cum basibus stipitum paleis nitidis nigris acicularibus dense vestito, tota planta pilis minutis ferrugineis glandulosis vestita et praecipue eis ciliata; stipite 10-20 cm. alto, gracile; fronde 10-15 cm. alta, deltoidea, acuminata; pinnis liberis utroque latere plerumque 2, quarum infima furcata deltoidea, parte mediali-apicale profunde pinnatifida secutis; segmentis majoribus lobatis, minoribus crenatis vel integris, acuminatis, herbaceis; soris sparsis vel utroque latere venarum uniseriatis; indusio glandulifero; ciliato, minuto, mox difficile detectu.

No. 12149, Sibuyan Island, alt. 500 m. "Payung-payung."

Distinguishable from the next by the black paleae, acuminate segments, small and inconspicuous indusia, and denser pubescence. This is more likely than the following to be *Aspidium coadunatum Wall.*

Tectaria Christii Copel. in Philip. Journ. Sci. II (1907) 416.

This species is ambiguous, and I take this opportunity to explain my opinion of its status. The name was published because I regarded *Aspidium coadunatum Wall.* as not valid for transfer; but because I was also in some doubt as to the original fern itself, I took care to refer to *Christ's* diagnosis to establish the fern in mind and in hand, *Copeland*, 1899, from Bontoc. I am now decidedly of the opinion that *Christ* erred in identifying this plant with that of *Wallich.* The name *T. Christii* is to be held for *Christ's* plant of the Philippines, diagnosed by *Christ*, the type

being my number 1899. The Indian and African plants, as far as I know them, are different, and the African plant at least is distinct from *T. adenophora*.

ADIANTUM Linn.

Adiantum cupreum Copel. spec. nova.

A. opaco Copel. affine, quo frondibus plerumque minoribus, pinnulis plus orbicularibus et minus opacis, sub luce oblique pulcherrime cupreo-nitentibus, et soris maximis 1 vel 2 distinguendum.

No. 12400, Sibuyan Island, alt. 450 m.

"Small terrestrial tufts in fertile soil among rocks of a deeply shaded declivity...... Fronds strongly recurved or nearly flat, pointing down hill." The stipes are 5 to 15 cm. long; fronds 10 to 15 cm. high and wide; coriaceous reflexed margin ("indusium") 3 to 5 mm. wide, 1 to 1.5 mm. deep. Like *A. opacum*, this has the sporangia confined to the veinlets, and pinnules deciduous and bordered by a very narrow hyaline margin. *A. opacum* is also copper-colored by very oblique reflected light, but much less brilliantly so.

ATHYRIUM Roth.

Athyrium sibuyanense Copel. spec. nova.

Stipite 50-100 cm. alto, basi nigro echinatoque et paleis brunneis caducis vestito, sursum rhachique stramineo-viridibus, glabris, inermibus; fronde ca. 1 m. alta, deltoidea, bi-tripinnata; pinnis infimis oppositis, horizontalibus, stipitatis, usque ad 40 cm. longis, 15 cm. latis, acuminatis, pinnis brevistipitatis, 3-4 cm. latis, acuminatis, rhachin pinnae versus pinnatis, dein pinnatifidis; pinnis ^{II} sessilibus vel adnatis, oblongis, apice rotundatis, liberis basi leviter auriculatis, 5-7 mm. latis, leviter serratis, glabris, coriaceis; venulis utroque latere 7-9; soris costularibus 0.5 ad marginem protensis, indusio brunneo, angusto.

No. 12510, on a wooded ridge of Sibuyan Island, alt. 1350 m. Group of *A. cyatheifolium*.

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NOTES AND DESCRIPTIONS OF PHILIPPINE FUNGI—I

BY

H. and P. Sydow

(Berlin, Germany)

UREDINEAE

Uredo Dioscoreae-alatae Racib. in Parasit. Algen u. Pilse Javas I, p. 30.

On leaves of *Dioscorea* sp. Todaya (Mt. Apo), District of Davao, Island of Mindanao, October, 1909. (*Elmer* No. 11906).

XYLARIACEAE

Xylaria obovata Berk. in Cuba Fg. no. 785.

On rotten sticks. Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910. (*Elmer* No. 12394).

Xylaria scruposa Berk. et Fr. in Cuba Fg. no. 802.

On rotten trunks. Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10605).

SPHAERIACEAE

Pseudomeliola placida Syd. nov. spec.

Peritheciis hypophyllis, maculas minutas 1-2 mm. diam. fuscas formantibus, mycelio parco ex hyphis fuscis irregulariter ramosis 6-10 micro. crassis composito insidentibus, glomerulatis, superticialibus, ovatis vel ovato-elongatis, 250-300 micro. altis, 150-200 micro. latis, subcarbonaceis, distincte papillatis, obscure brunneis; ascis cylindraceis, breviter pedicellatis, 70-130 micro. longis, 7-10 micro. latis, octosporis; sporidiis filiformibus, pluries guttulatis, 60-100 micro. longis, 1.5-2.5 micro. crassis, hyalinis, saepe leniter curvulis; paraphysibus numerosis, hyalinis, filiformibus, ca. 1 micro. crasis.

On living leaves of *Semecarpus perrottetii March.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, August, 1909. (*Elmer* No. 11282).

Stigmatea bullata Syd. nov. spec.

Maculis orbicularibus, in hypophyllo ochraceis obscurius marginatis, 2-4 mm. diam., leniter bullatis; peritheciis epiphyllis, totam maculam occupantibus, densissime aggregatis, globosis, atris, 70-100 micro. diam., pariete 18-20 micro. crasso, apice tantum prominulis, pertusis; ascis clavatis, apice rotundatis, breviter pedicellatis, 45-70 micro. longis, 14-18 micro. latis, octosporis; sporidiis distichis, utrinque obtusis, medio 1-septatis, non constrictis, hyalinis, 18-22 micro. longis, 5-7 micro. latis; paraphysibus ascos aequantibus, filiformibus, 1 micro. crassis.

On living leaves of *Schefflera mindanaensis Merr.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10469).

PERISPORIACEAE

Meliola amphitricha Fr. Elench. Fg. vol. II, p. 109.

On leaves of *Pithecolobium apoense Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, September, 1909. (*Elmer* No. 11709).

MICROTHYRIACEAE

Asterina escharoides Syd. nov. spec.

Peritheciis amphigenis, irregulariter aggregatis, saepe in greges rotundatos 2-10 mm. latos dispositis, subinde etiam per magnam folii partem aequaliter vel irregulariter distributis, radiatim contextis, centro perforatis, tenuibus, 100-175 micro. diam., ambitu fibrillis 40-70 micro. longis praeditis, atris, mycelio tenui parce evoluto, et hyphis 4-6 micro. crassis ramosis septatis hyphopodia minuta 6-9 micro. longa gerentibus composito; ascis globosis vel subglobosis, 32-42 micro. longis, 30-35 micro. latis, octosporis; sporidiis conglobatis, ellipsoideis, utrinque rotundatis, medio 1-septatis et constrictis, ex hyalino brunneis, verrucis lineatim dispositis distincte obsitis, 20-26 micro. longis, 11-14 micro. latis.

On leaves of *Platea apoense Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, June, 1909. (*Elmer* No. 10875, type); on leaves of *Pittosporum clementis Merr.*, same locality, August, 1909. (*Elmer* No. 11324).

This species is distinguished by its verrucose spores, the warts being arranged in longitudinal rows.

Asterina diaphana Syd. nov. spec.

Peritheciis hypophyllis, superticialibus, in greges rotundatos vel irregulares 0.5-2 cm. latos laxe dispositis, 100-200 micro. diam., radiatim contextis, planis, tenuissimis, atris, submicroscopio fuligineis et diaphanis, poro minuto centrali apertis; mycelio parce evoluto, radiante, et hyphis irregulariter ramosis 4-6 micro. crassis hyphopodia solitaria bicellularia elongato-ovoidea fusca 20-28 micro. longa 10-14 micro. lata gerentibus composito; ascis globosis vel subglobosis, 35-55 micro. longis, 35-42 micro. latis, octosporis, aparaphysatis; sporidiis conglobatis, oblongo-ellipsoideis, utrinque rotundatis, 1-septatis, ad septum valde constrictis, facile in loculos secedentibus (loculis aequalibus vel subaequalibus), diu hyalinis, tandem fuscis, muco hyalino copiose obductis, 21-28 micro. longis, 12-15 micro. latis.

On living leaves of *Solanum manucaling Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, September, 1909. (*Elmer* No. 11695).

Asterina Elaeocarpi Syd. nov. spec.

Mycelio epiphyllo, maculas atras formante vel saepius totam folii superticiem irregulariter obtegente, atro, et hyphis dense breviterque ramosis 4-6 micro. crassis hyphopodia alternantia 6-7 micro. longa gerentibus composito; peritheciis dense sparsis, radiatim contextis, 100-180 micro. diam., atris, centro perforatis; ascis ovatis, 42-60 micro. longis, 28-35 micro. latis, octosporis; sporidiis conglobatis, ellipsoideis, utrinque rotundatis, medio 1-septatis et constrictis, et hyalino fuscis, 26-30 micro. longis, 10-13 micro. latis.

On leaves of *Elaeocarpus pendula Merr.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, August, 1909. (*Elmer* No. 11405).

Asterina Elmeri Syd. nov. spec.

Peritheciis epiphyllis, densissime aggregatis et maculas orbiculares 2-10 mm. diam., confluendo saepe irregulares formantibus, orbicularibus, 120-180 micro. diam., radiatim contextis, centro perforatis, atris, opacis; mycelio et hyphis dense intertextis anastomosantibus obscure brunneis 6-8 micro. latis hyphopodia solitaria vel opposita continua 9-11 micro. longa et 4-5 micro. lata gerentibus composito; ascis globosis vel subglobosis, 40-50 micro. longis, 30-45 micro. latis, octosporis; sporidiis conglobatis, ellipsoideo-oblongis, utrinque rotundatis, medio 1-septatis et constrictis, ex hyalino brunneis, 25-30 micro. longis, 10-14 micro. latis.

On leaves of *Champereia fragilis Elm.* Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910. (*Elmer* No. 12143[a]).

DOTHIDEACEAE

Phyllachora Canarii P. Henn. in Hedwigia vol. XLVII, 1908, p. 254.

On leaves of *Canarium laciniatum Elm.* Todaya (Mt. Apo) District of Davao, Island of Mindanao, July, 1909. (*Elmer* No.

11124); also on *Canarium todayense Elm.*, same locality, August, 1909. (*Elmer* No. 11281).

Phyllachora luzonensis P. Henn. in Hedwigia vol. XLVII, 1908, p. 255.

On living leaves of a small tree in woods near the seacoast. Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910. (*Elmer* No. 12456).

Phyllachora Glochidii Syd. nov. spec.

Stromatibus epiphyllis, sparsis, minutis, ca. 1 mm. diam., rotundatis, atris, 1-paucilocularibus; ascis cylindraceis, brevissime pedicellatis, apice rotundatis, 60-90 micro. longis, 9-13 micro. latis, octosporis; sporidiis oblique monostichis, ellipsoideis, utrinque rotundatis, continuis, hyalinis, 14-16 micro. longis, 5-7 micro. latis.

On leaves of *Glochidion mindanaense Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10596).

Phyllachora Elmeri Syd. nov. spec.

Stromatibus epiphyllis, in hypophyllo haud conspicuis, sparsis, minutis, rotundatis, 0.5-1 mm. diam., atris, intus 1-paucilocularibus; ascis clavatis vel clavato-saccatis, breviter pedicellatis, 40-60 micro. longis, 11-18 micro. latis, octosporis; sporidiis monostichis vel irregulariter distichis, subglobosis vel late ellipsoideis, continuis, hyalinis, 10-14 micro. longis, 8-10 micro. latis.

On living leaves of *Ficus manilensis Warb.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, June, 1909 (*Elmer* No. 10852).

The small stromata are characteristic for this species.

Phyllachora apoensis Syd. nov. spec.

Stromatibus hypophyllis, in epiphyllo haud conspicuis, sparsis, rotundatis vel irregularibus, 0.5-2 mm. longis, atris,

intus paucilocularibus; ascis clavatis vel clavato-saccatis, breviter pedicellatis, 50-75 micro. longis, 11-18 micro. latis, octosporis; sporidiis irregulariter distichis vel oblique monostichis, ellipsoideis, continuis, hyalinis, 14-18 micro. longis, 7-9 micro. latis.

On leaves of *Ficus sibulanensis Elm.*, Todaya (Mt. Apo), District of Davao, Island of Mindanao, July, 1909. (*Elmer* No. 11159); on leaves of *Ficus apoensis Elm.*, same locality, May, 1909. (*Elmer* No. 10710).

Phyllachora Fici-fulvae Koord. in Botan. Untersuchungen, etc., p. 182.

On leaves of *Ficus banahaensis Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, June, 1909. (*Elmer* No. 10906).

Phyllachora graminis (Pers.) Tuck. Symb. Myc. II, 216.

On leaves of *Rottboellia tongcalingii Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, June, 1909. (*Elmer* No. 10987).

Plowrightia Derridis (P. Henn.) Syd. *Microcyclus Derridis P. Henn.* in Annales Musées Congo sér. V, vol. II, fasc. II, 1907, p. 99).

On leaves of *Spatholobus apoensis Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, September, 1909. (*Elmer* No. 11796).

The Philippine fungus agrees perfectly with *Hennings'* species which has been only known on *Derris* from several localities in Africa. This fungus represents a foliicolcus *Plowrightia*. The stromata are of the same structure as in *P. basiruta*, *P. Koordersii* and *P. placida*.

Darwiniella Orbicula Syd. nov. spec.

Stromatibus hypophyllis, sparsis, per epidermidem erumpentibus et subsuperticialibus, orbicularibus, pulvinatis, applanato-globosis, atris, 0.33-1 mm. diam., intus pallidioribus; loculis numerosissimis, omnino immersis, 110-175 micro. diam.; ascis clavatis, apice rotundatis, breviter pedicellatis, 50-70 micro-

longis, 14-16 micro. latis, octosporis; sporidiis distichis, cylindraceo-fuscideis, leniter, inaequilateris, utrinque acutis, 3-septatis, haud constrictis, hyalino-chlorinis, 25-32 micro. longis, 4-5 micro. latis; paraphysibus ascos superantibus, filiformibus, 1.5 micro. crassis.

On leaves of *Cryptocarya todayensis Elm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10714).

PHACIDIACEAE

Nymanomyces Aceris-laurini P. Henn. in Monsunia vol. I, 1899, p. 28.

On leaves of *Acer niveum Blm.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10574).

SPHAEROPSIDEAE

Placosphaeria Durionis Syd. nov. spec.

Stromatibus epiphyllis, in hypophyllo haud vel vix conspicuis, hinc inde in greges irregulares 0.5-2 cm. diam. laxe et aequaliter dispositis, minutis, rotundatis, ca. 0.5 mm. diam. atris; loculis minutissimis, ca. 4-8 in quoque stromate; sporulis numerosis, bacillaribus, continuis, hyalinis, eguttulatis, 34-micro. longis, 1 micro. latis; basidiis filiformibus, 20-35 micro. longis, 1.5 micro. latis.

On living leaves of *Durio zibethinus Murr.* Todaya (Mt. Apo), District of Davao, Island of Mindanao, July, 1909. (*Elmer* No. 11104).

STILBACEAE

Stilbum cinnabarinum Mont. in Ann. Sc. Nat. ser. II, vol. VIII, 1837, p. 360.

On limbs. Todaya (Mt. Apo), District of Davao, Island of Mindanao, May, 1909. (*Elmer* No. 10715).

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SYNOPSIS OF THE PHILIPPINE MENISPERMACEAE

By

Prof. Dr. L. Diels

(Marburg, Germany)

The following synopsis of the Philippine *Menispermaçeae* is based upon my monograph of the order in "Pflanzenreich" pt. IV, no. 94, 1910, in which complete descriptions of all species as well as other particulars are given.

Key to the genera.

A. Seeds without albumen.
  Flowers in short cymes or solitary; number of floral parts irregular; leaves oblong or elliptical............1. *Pycnarrhena.*

B. Seeds albuminous.
  a. Drupes and seeds straight (not curved).
    I. Endocarp (stone of drupe) without an inner protuberance or "Condyle"; leaves large, cordate or triangular.
      1. Drupes subglobular; cotyledons folded; stamens 9-12..............2. *Arcangelisia.*

2. Drupes flattened; cotyledons flat; stamens 6. . .3. *Tinomiscium.*

II. Endocarp with an inner condyle; stamens 6; leaves medium sized.

1. Stamens free. . . . . .4. *Tinospora.*

2. Stamens connate . . . . .5. *Parabaena.*

b. Drupes more or less curved, seeds therefore often horseshoe shaped; endocarp with an inner condyle.

I. Carpels 3.

1. Stamens numerous, irregular; leaves cordate . .6. *Anamirta.*

2. Stamens 7-10, irregular; leaves ovate or oblong. . .7. *Hypserpa.*

3. Stamens 6, regular.

* The 3 inner sepals valvate. . . . . .8. *Limacia.*

* All sepals imbricate.

\+ Style bifid; anthers longitudinally dehiscent . . . . .9. *Pericampylus.*

\+ Style undivided; anthers transversely dehiscent.

= Inflorescence growing from the stem; condyle septiform. . . .10. *Diploclisia.*

= Inflorescence axillary; condyle shorter and rounded . . . . .11. *Cocculus.*

II. Carpel 1.

1. Female and staminate flowers alike; style undivided or shortly lobed. . . . . .12. *Stephania.*

2. Female flowers assymmetrical, sepals and petals 2 or 1; style trifid.

* Male flowers corymbose..............13. *Cissampelos.*
* Male flowers paniculate..............14. *Cyclea.*

List of the species.

1. PYCNARRHENA Meirs.

1. **Pycnarrhena manillensis Vidal** in Revis. Pl. Vasc. Filip. (1886) 45; *Diels* in Monogr. 52.

Leaves bullate above. Endemic in Luzon and Mindanao.

2. **Pycnarrhena Merrillii Diels** n. sp. in Monogr. 52.

Leaves minutely reticulate or smooth above, acute. The flowers of this species have not yet been discovered. Endemic in Mindoro (*Merrill* n. 1201).

3. **Pycnarrhena elliptica Diels** n. sp. in Monogr. 54.

Leaves smooth above, obtuse. The flowers of this species are not yet known. Endemic in Palawan (*Bermejos* n. 211).

The Philippine forms of this genus are in need of further investigation. The collectors should look for the flowers of both sexes.

2. ARCANGELISIA Becc.

1. **Arcangelisia lemniscata (Miers) Becc.** in Malesia I (1877) 147; *Diels* in Monogr. 106.

Apparently throughout the islands. This beautiful species is often confused with *Anamirta cocculus*, which is very like it in foliage. The number of stamens and the structure of the big drupes separate it at once. Java to New Guinea.

3. TINOMISCIUM Miers.

1. **Tinomiscium philippinense Diels** n. sp. in Monogr. 116.

This genus, distributed throughout the Indian Archipelago, was only recently recorded from the Philippines. Endemic in Luzon and Mindanao.

4. TINOSPORA Miers.

1. **Tinospora Merrilliana Diels** n. sp. in Monogr. 137.

Petals not inflexed, fleshy, conspicuous. Leaves ovate. Endemic in Mindanao.

2. **Tinospora negrotica Diels** n. sp. in Monogr. 137.

Petals similar to those of *T. Merrilliana*, and perhaps only a form of it. Leaves nearly triangular. Endemic in Negros (*Elmer* n. 9468).

3. **Tinospora reticulata Miers** in Contrib. Bot. III (1871) 36; *Diels* in Monogr. 143.

Petals inflexed, thin. Luzon and Mindanao.

5. PARABAENA Miers.

1. **Parabaena denudata Diels** n. sp. in Monogr. 147.

Inflorescence not flexuose. Leaves glabrous above. Endemic in Mindanao and Negros.

2. **Parabaena Elmeri Diels** n. sp. in Monogr. 147.

Inflorescence not flexuose. Leaves hairy on both sides. Endemic in Luzon.

3. **Parabaena philippinensis Merr.** ms. ex *Diels* in Monogr. 148.

Inflorescence flexuose. Endemic in Luzon (*Merrill* n. 1024).

6. ANAMIRTA Colebr.

1. **Anamirta cocculus (L.) Wight et Arn.** in Prodr. I (1834) 446; *Diels* in Monogr. 108.

Apparently also throughout the islands. Compare the note under *Arcangelisia*. India to New Guinea.

7. HYPSERPA Miers.

1. **Hypserpa cuspidata (Wall.) Miers** in Contrib. Bot. III (1871) 102, pl. 108; *Diels* in Monogr. 206.

Leaves nearly glabrous. From India through Borneo to the Philippines. Luzon and Negros.

2. **Hypserpa Jagorii Diels** n. sp. in Monogr. 211.

Leaves hairy. Endemic in Luzon and Mindanao.

8. LIMACIA Lour.

1. **Limacia velutina (Wall.) Miers** in Contrib. Bot. III (1871) 110; *Diels* in Monogr. 215.

Luzon, Mindanao and Basilan. Farther India, Malay Peninsula, Sumatra and Celebes.

9. PERICAMPYLUS Miers.

1. **Pericampylus incanus (Colebr.) Miers** in Contrib. Bot. III (1871) 118, pl. 111; *Diels* in Monogr. 217.

Common throughout the islands. From India to the Moluccas.

10. DIPLOCLISIA Miers.

1. **Diploclisia glaucescens (Blume) Diels** in Monogr. 225.

Sulu Archipelago and Mindanao. India to New Guinea.

11. COCCULUS DC.

1. **Cocculus trilobus (Thunb.) DC.** Syst. I (1818) 522; *Diels* in Monogr. 232.

Leaves hairy beneath, subovate or trilobed. Sabtan, Luzon, Japan and China.

2. **Cocculus sarmentosus (Lour.) Diels** in Monogr. 233.

Leaves subglabrous, elliptical, entire. Camiguin and Mindanao. From Southern China to Java.

12. STEPHANIA Lour.

1. **Stephania catosepala Diels** n. sp. in Monogr. 268.

Inflorescence large, composed of corymbs, umbels or panicles. Petals inside papillose-glandular. Outer sepals narrow, spathulate. Filament thick. Endemic in Luzon (*Elmer* n. 5851 and others).

2. **Stephania Merrillii Diels** n. sp. in Monogr. 268.

Outer sepals shorter, oblong. Filament 0.6 mm. long. Endemic in Mindoro, Negros and Mindanao.

3. **Stephania japonica (Thunb.) Miers** in Contrib. Bot. III (1871) 213; *Diels* in Monogr. 277.

Inflorescence umbellate. Petals not glandular. Flowers glabrous. Batanes, Luzon, Negros and Mindanao. From India and Japan to the Philippines.

4. **Stephania Forsteri (DC.) A. Gray** in Bot. Wilkes Exped. I (1854) 36; *Diels* in Monogr. 278 (*Stephania exigua Miers*).

Flowers papillose. Batangas. Java to Polynesia.

13. CISSAMPELOS Linn.

1. **Cissampelos pareira Linn.** Sp. Plant. I (1873) 1031; *Diels* in Monogr. 286. (*Cissampelos Cumingii Miers, Cissampelos discolor Miers*).

Common throughout the islands and in all tropical countries. This species is often confused with *Pericampylus incanus*, but very easily recognized by its flowers.

14. CYCLEA Arn.

1. **Cyclea Merrillii Diels** n. sp. in Monogr. 312.

Endemic in Luzon at Bulacan.

Very likely other species of this genus will be found in the Philippine Islands.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. IV. Manila, P. I., November 14, 1911. Art. 64.

A NEW CAREX

By

G. Kükenthal

(Coburg, Germany)

Carex palawanensis Kük. spec. nova.

Rizoma caespitosum. Culmus 25-50 cm. altus obsolete triangularis laevis inferne foliatus basi vaginis vetustis in fibras dissolutis atro-brunneis obtectus. Folia culmum superantia basi plicata dein plana 5 mm. lata coriacea cinereo-viridia, vaginae brunneae multirostatae. Inflorescentia subpaniculata vel spiciformis e spicis 4 distachyis vel monostachyis distantibus vel subopproximatis formata. Spiculae ovatae androgynae 5-6 mm. longae densiflorae e cladoprophyllo utriculiformi enatae. Bracteae foliaceae longissimae breviter vaginantes, summa patens. Squamae fem. ovatae aristatae sordida stramineae multinervosae. Utriculi squamas longe superantes demum patentes rhomboidales subventricoso-trigoni 4 mm. longi stramineo-virides glabri multinervosi basi rostrati apice in rostrum longum conicum marginibus spinulosum bidentatum sensim attenuati. Stigmata 3.

Philippine Islands; island of Palawan, Puerto Princesa, May, 1911, *A. D. E. Elmer*, No. 13146. Common in wet sand gravelly soil among shrubs bordering streams in the hills at 500 feet altitude. The foliage has a very characteristic metallic hue.

Proxima *C. malaccensis C. B. Clarke*, a qua inflorescentia pauperiore, utriculis minoribus minus costatis marginibus valde spinulosis differt.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vo. IV. Manila, P. I., November 15, 1911. Art. 65.

ADDITIONAL SPECIES OF ELAEOCARPUS

By

A. D. E. Elmer

In article thirty five of this publication, *Dr. Aug. de Candolle* listed sixteen species and a few doubtful ones in his revision of our then known Philippine *Elaeocarpus*. Since that time new collections from the southern Philippines brought together many new additional ones, so that at the present time we know toward forty species in our archipelago.

The largest increase came in the collection made in the vicinity of mount Apo. In that great forested basin of the king of Philippine mountains, are extraordinary large trees with trunks five feet in diameter and reach a height of seventy five feet to the first limbs. The wood of most of our big tree species at middle elevations is moderately soft and light, very easily worked. The color is white with a slight tinge of yellow. Some of our low stocky trees in alpine regions have harder and whiter woods, while that of *E. foxworthyi Merr.* is fairly heavy, burly and reddish.

The ripe fruits are characteristic, the *Elaeocarpus* nut is always known by the corrugated stone seed. Most fruits of our Philippine species are covered by a smooth and shining coeruleus or aerugineously colored skin. *E. nervosus Elm.* and *E. gigantifolius Elm.* have smooth ruber red to purple fruits. That of *E. versicolor Elm.* is citrinus, although after lying on the ground and while the skin becomes soft, the color changes to incarnatus. The receptacles of many of our fig species undergo similar changes in color and texture. The fruits of *E. foxworthyi Merr.* and *E. minda-*

naensis by the same author are provided with a fuzzy fulvus or umber brown covering. The kernel of most species is rich in oil and very palatable.

The yellowish white flowers of *Elaeocarpus* species are rather of a dainty sort, occasionally naked but usually clothed with silvery or fulvous hairs. Some have a distinct pendant habit. Most of them are odorless, yet a few possess a honey fragrance. The persistent calyx frequently becomes reddish tinged when old. The ciliate to fimbriate or even laciniate petals prove a splendid character by which the genus can be recognized. The glabrous or silky pistil is surrounded at the base of the ovary by a series or ring of light yellow glands. When some of our floriferous tree species are in full flower they can be singled out of the forest mass at long distances.

Elaeocarpus venosus C. B. Rob.

A very characteristic species from the Mountain province (including Benguet and Lepanto), Luzon. Through an oversight it was omitted in *Dr. Aug. de Candolle's* revision.

Elaeocarpus foxworthyi Merr.

A medium sized tree; stem 2.5 feet thick, 35 to 45 feet high, quite crooked, terete except the wadded base, its main branches widely spreading from the middle; branchlets rather slender and spreading, tips suberect; wood moderately hard and burly, odorless, nearly tasteless, quite heavy, the sapwood white, otherwise deeply tinged with red; bark thick, reddish brown except the mottled smooth epidermis; leaves horizontal, parchment-like, the sides usually curved upon the paler lower surface, the midvein and the lateral nerves beneath testaceus brown as is also the petiole. Spikes divaricate, chiefly along the branchlets, 1 to 1.5 dm. long, densely rufous tomentose; pedicels stout, nearly 1 cm. long, densely ferruginous pubescent; calyx rigid, stellately spreading, the basal portion united; segments latericius hairy on the outside, 7 mm. long, 3 mm. wide toward the base, glabrous on the inner side and with a quite prominent midvein, yellowish green, ovately oblong, 5; petals free, of the same number, quite rigid, well spreading out, glabrous on both sides, flat, sulphureous, strongly nerved,

a trifle exceeding the sepals, 5 mm. wide above the middle, the upper one third divided into unequal setaceous and castaneous colored segments, inserted about the base of the disk; hypogenous rim densely hairy, rugose, yellowish; stamens toward 20, erect from the glandular disk; filaments nearly 1 mm. long, subglabrous; anthers 2 to 3 mm. long, linear, subterete, subscabrous, longitudinally ridged, split at the apex into 2 very short equal lobes, 0.33 mm. thick, dehiscing terminally; ovary broadly conical, densely hairy, gradually tapering into the pubescent style scarcely longer than itself, toward the united apex glabrous. Fruits pendant, latericius fuzzy, short ellipsoid or subglobose, 3.75 cm. across, exocarp green and dry; stony seed large, brown and shallowly rugose.

Represented by number 12739, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Here and there scattered in woods of shallow fertile soil with a gravelly subsoil at 250 feet altitude. The flowers, fruits and wood specimen were taken from the same tree, and our fruiting specimens are exactly like *Merrill's* type number.

Elaeocarpus cuernosensis Elm. n. sp.

A low scrubby tree; branchlets smooth, terete, flexible, the leaf bearing portion ascending; twigs slightly strigose but soon becoming glabrous. Leaves very numerous, ascending, chartaceous, deep green especially the upper side, dull brown when dry, somewhat folded above especially toward the strongly recurved acumi nate tips, in the young state densely pubescent at least beneath, when old glabrate, the average blades 6 cm. long by 3 cm. wide across the middle, alternatingly scattered along the branchlets, base obtuse, margins finely dentately serrate except near the base, elliptish; nerves 4 to 6 pairs, very oblique, only slightly curved, nearly as prominent as the midvein, tips anastomosing, with hairy glands in their axils, reticulations very fine and quite evident, all more or less softly strigose along the nerves beneath; petiole less than 1 cm. long, striate on the upper side, subolivaceous strigose but soon wearing glabrous; bud bracts acuminate, sericeous. In frutescent spike suberect, not exceeding 5 cm., subglabrous, from the lowermost leaf axils; fruits alternatingly scattered especially toward the apex, ovoidly ellipsoid, shining, glabrous

when old, 9 mm. long, 6 mm. thick below the middle, deep aerugineus when mature, its stone-like seed finely rugose; pedicel strict, nearly as long as the fruit.

Type specimen 9653, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, March, 1908.

Discovered along the trail on a mossy ridge at 5000 feet and formed one of the many kinds of low stocky trees or interlaced shrubs.

Distributed under *E. mastersii King.* As to our Philippine *Elaeocarpus* it is nearest to *E. merrittii Merr.* but leaves more elliptic, not ovately so, acute to obtuse at base, not rounded; petioles not so slender nor infrutescence as long and with apparent smaller fruits. The prominent axillary glands on *Merrill's* specimen are minute or nearly obsolete in ours.

Elaeocarpus fusicarpus Elm. n. sp.

Small erect tree, 10 m. high, with a 1.5 dm. thick stem; branches lax and numerous, terete, widely spreading, the young twig portion isabellinus pubescent but very soon glabrous; bark grayish mottled, lenticelled, thin, the inner surface yellowish green; wood delicately white, soft, light, odorless and tasteless. Leaves ovately oblong, ample, alternatingly scattered along the branchlets, membranous, conduplicately recurved, lucid and deeper green on the upper side, duller beneath, the two sides very unequal brown when dry, glabrous above, finely pubescent beneath especially along the nerves, obscurely crenately serrate, the larger blades 9 cm. long by 4 cm. wide across the middle or below it, frequently much smaller, gradually tapering to the acute to acuminate apex, base broadly rounded; petiole scarcely exceeding 5 mm., finely cinereous, flattened along the upper side; midvein pronounced, hairy, lateral pairs 4 to 6, ascendingly curved, tips anastomosing, also pubescent, the hairy axillary glands nearly obsolete, reticulations obscure. Floral spikes suberect, chiefly from the upper leaf axils, slen er, softly covered with isabellinus hairs, 5 to 8 cm. long; flowers alternatingly scattered above the middle mainly, slightly odorous, pendulous; bracts subtending the pedicels linear to oblongish, 5 mm. long, softly pubescent, subdeciduous; pedicels 5 to 7 mm. long, soft pubescent, subrecurved, yellowish green flowers slightly odorous, pendulous; calyx creamy white, the 5

segments nearly free and strigosely hairy on the outer side, lanceolate, 6 mm. long, 1.75 mm. wide below the middle or toward the base, glabrous on the upper side, in the dry state brown with yellowish margins, subpersistent; petals pure white, free, equal in number and length, densely hairy on the back, finely strigose or subglabrous on the inner side, cuneate in outline, usually 3-lobed nearly to the middle, each of the divisions segmented into 2 or 3 curved and twisted glabrous lacinae, subhyaline and 3-nerved, 2 mm. wide across the middle, the sides of the cuneate base usually rolled upon the upper side, set in between the glands which are yellow, conspicuous, finely and softly pubescent and usually shallowly grooved along the dorsal line; stamens about 20, erect, crowded and inserted upon the ovary ring of glands; filaments yellowish, finely scabrous, 1 mm. long, occasionally forked; subterete; anthers similarly colored except the greenish tips, linearly oblong, 2 mm. long, scaberulous, angularly terete, split at the apex which bears ciliate hairs or bristles, dehiscing apically; pistil 7.5 mm. long; ovary short, ovoid, densely hairy, whitish; style terete, fleshy, hairy below the middle of the same color, bearing a minute greenish stigma; fruits 2.5 cm. long, 1 to 1.5 cm. thick across the middle, subpyriform or fusiform, irregularly terete, green, hard, containing a comparatively small sharply pointed and shallowly rugose stony seed; pericarp thick, with maturity aerugineus; main stalks occasionally branched.

Type specimens 10819 for flower and 11769 for fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June and September respectively, 1909; also number 10828 from the same locality.

The flowering type was collected on a high open knoll covered with bamboos and light woods at 3750 feet south of the Baruring river; the fruiting type was collected on very steep or nearly precipitous slopes of the Sibulan river at 3000 feet altitude. Number 11769 the Bagobos call "Marintok" the other two numbers "Lanauti".

Number 10828 apparently has larger flowers than the type number, and is also more pubescent. Closely related to *E. procerus Aug. DC.* but leaves longer, less numerously crowded and much slenderer pointed toward the apex. Our flowers are smaller and their bracts are in proportion. The fruits of *Aug. de Candolle's* species are not known.

Elaeocarpus nervosus Elm. n. sp.

A large tree; trunk 20 m. high, thicker than 1 m., terete; branches mainly at the top and spreading, the ultimate ones lenticelled, rather crooked yet slender; branches comparatively thick, yellow on the inner side; wood moderately soft, white with a slight yellow tinge, light, without odor or taste. Leaves chartaceous, deeply conduplicate on the upper dark green and 'shining surface, duller and lighter green beneath, grayish brown when dry, alternating along the branchlets, quite variable in size, glabrous, elliptic or ovately elliptic, the larger blades 1 dm. long, 5.5 cm. wide across the middle or immediately below it, entire toward the broadly rounded base which is obtuse in the smaller leaves, apex obtuse or acute, otherwise crenately serrate but very shallowly so; midvein prominently raised beneath, reddish brown in the dry state; lateral nerves very conspicuous from beneath, glabrous, similar in color, ascendingly curved, their ends coarsely anastomosing, 5 to 7 on a side, reticulations very obscure; petiole reddish green, varying from 1 cm. long on the smaller leaves to 3 cm. long for the larger ones, terete, glabrous, rather stout. Inflorescence mainly along the twigs below the foliage, profuse; spikes 0.5 to 1.5 dm. or occasionally 2.5 dm. long, angularly striate, puberulent, flexible, ultimately glabrous, divaricate; pedicel 1 cm. long, rather stout, puberulent; calyx thick and rigid, 5, puberulent, ovately oblong, 7 mm. long by 3 mm. wide below the middle, dull red; petals below the glands creamy white, 6 mm. long, 5 mm. wide above the middle, cuneate at the base, fan-like, the linear lacinae numerous and extending to below the middle, finely ciliate along the margins below the middle, numerously nerved, thick and rigid at the base, 5, caducous; the hypogynous rim boldly and roundly 5-lobed, glabrous; stamens yellowish gray, toward 30; filaments subglabrous, relatively slender, 1 mm. long, usually with a single or double bend; anther 2 mm. long, 0.5 mm. thick, also subglabrous, obscurely flattened and grooved on the sides, terminated by 2 short and blunt equal lips, dehiscing terminally; ovary flatly conical, subscabrous, terminated into a very short point or style. Fruit hard, ellipsoid, 2 cm. long, 1.5 cm. thick across the middle, pleasing deep red, the stone seed with shallow convolutions.

Type specimens 11566 for flower and 10802 for fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May and August respectively, 1909.

The flowering type was discovered in the dense mossy forested basin at 5250 feet along the Mararag creek of Apo; the fruiting specimens were gathered on a forested ridge at 500 feet lower altitude of mount Calelan. The former was called "Onas," the latter "Caleso" by the natives or Bagobos.

E. cumingii Turcz. is its nearest ally, but the leaves have a different cut and nerves much more pronounced than in *Cuming* 807.

Elaeocarpus gitingensis Elm. n. sp.

A middle sized tree; stem 13 m. high. 4.5 dm. thick, its main branches arising from below the middle; wood burly and whitish at least on the outside, odorless, tasteless; bark thick, yellowish on the inner side, grayish and smooth on the epidermis; branches numerous, lax, widely spreading, the glabrous and ultimate ones suberect. Leaves alternate, glabrous, submembranous, recurved especially toward the acuminate apex, somewhat folded upon the upper darker green suface, copious, drying dull brown, margins wavy and finely dull serrate especially above the middle, lanceolate to oblongish, base acute to obtuse, the larger blades nearly 7.5 cm. long by fully 2 cm. wide across the middle; petiole very slender, glabrate, 1.5 to 2 cm. long; midvein conspicuous, with fine grayish hairs along its sides in the early state; lateral nerves 5 to 7 on a side, much ascending, only slightly curved, not conspicuous nor reticulations evident. Inflorescence spicate, ascendingly spreading, mostly from the uppermost leaf axils, the stalks green and covered with a cinereous pubescence, ultimately nearly glabrous, 5 to 8 cm. long; flowers odorous, pendulous, creamy white; pedicels cinereous subrecurved, ultimately glabrous, slender, 6 mm. long; calyx united at the cup shaped base, otherwise erect, also minutely cinereous, segments 5, lanceolately oblong, 5 mm. long by 1.5 mm. wide across the base, whitish margins puberulent; creamy white petals free, caducous, fully as long as the sepals, oblongish in outline, light creamy yellow, cinereous below the middle on the back, bright or silvery white hairy, canescent on the middle region of the inner side, the apical one half divided into 5 to 7 glabrous laciniate

segments; ovary glandular, rim deep yellow, with short silvery hairs; stamens 15, erect, crowded upon the ovary disk; filament 1 mm. long, finely strigose, subcompressed; anthers brownish, 2.5 mm. long, 0.5 mm. thick, lobular, quadrangular, hispidulous, terminating into 2 unequal lips, dehiscing terminally; ovary covered with dense silvery hairs, otherwise greenish; style slender, 5 mm. long, subglabrous, the greenish stigma minute; fruits less than 1.25 cm. long, nearly 7.5 mm. thick across the middle, shining deep dull green, ellipsoid.

Type specimens 12050[a] for flower and 12470 for fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, March and May respectively, 1910.

In compact soil of woods along the Pauala river or on hills at 750 feet.

Quite similar to *E. curranii Merr.* yet very different specifically.

Elaeocarpus versicolor Elm. n. sp.

Large widely spreading tree; stem 1.33 m. thick, 20 m. high, terete and somewhat crooked; wood soft, yellowish white, light, odorless and without taste; bark gray, densely covered with lenticels or excrescences, 1.25 cm. thick, yellowish on the inner surface; main branches arising from above the middle, the ultimate ones glabrous and quite numerous, thereby forming bushes. Leaves very smooth on both sides, glabrous at all times, much deeper green on the upper conduplicate side, alternate, not numerous, mostly toward the ends of the twigs, ovately elliptic, curing dull green, the average blades 1 dm. long by 5.5 cm. wide below the middle, apex acute or obtuse, subentire toward the obtuse or obtusely rounded base, otherwise crenately serrate; midvein quite prominent beneath, reddish brown when dry; lateral ones 5 to 7 pairs, ascendingly curved, their tips anastomosing, all smooth and glabrous, articulations obscure; petioles subterete, glabrous, 2 to 3 cm. long, a trifle thickened at both ends. Spikes divaricately spreading from the branchlets below the foliage, profuse, 1 to 1.5 dm. long or less, strict, stout, glabrous or in the younger state pulverulent, terete, striate; pedicels very similar, divaricately recurved, 1 cm. long; fruits alternatingly scattered, mainly above the middle, 2.5 cm. long, at least 1 cm. thick across the middle, terete, bluntly ellip-

soid or elongate in outline, smooth, hard and luteus, but soon after falling becoming soft and turn nearly ruber red; stone seed large and rugose.

Type specimen 12761, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in a densely forested humid flat at 500 feet altitude along the Iwahig river.

Not *E. multiflorus Turcz.* by fruits; neither is it *E. oblongatus Gaertn.*

Elaeocarpus fulvus Elm. n. sp.

Lofty tree; stem 6 dm. thick, 20 m. high or higher, terete, not straight; main branches comparatively short, crookedly spreading, the twigs floccosely fulvus which soon wears off; wood soft, yellowish white, odorless and tasteless, easily chopping; bark smoothish, brown, gray on the larger branches. Leaves submembranous, deeply conduplicate on the upper dark green surface, recurved toward the obtuse apex, lighter green beneath, drying brown, alternatingly crowded toward the ends of the twigs, mostly ascending, oblong, entire toward the obtuse or acute base, otherwise with fine serratures, glabrous when old, blades 1.25 dm. long by 4 cm. wide across the middle, young leaves densely fulvous covered on both sides; midvein conspicuous and reddish brown beneath; lateral ones 9 to 12 on a side, relatively conspicuous, divaricate or oblique, tips anastomosing, reticulations fine and quite evident from both sides; petiole fulvous felt covered, when old glabrate, 1 to 2 cm. long, flattened along the upper side. Inflorescence sparse, axillary or more frequently from the twigs beneath the foliage; spikes less than 5 cm. long, slender, in the early state densely clothed with soft short fulvous hairs; flowers pendulous, odorless, greenish, deciduous; pedicels very slender, 1 cm. long, slightly hairy toward the base; calyx rounded and united at the very base, glabrous on the inner side, on the outer side with crinkled fulvous hairs and with age becoming subglabrous, the midvein conspicuous especially on the inner side, oblong from the base, 5 mm. long, nearly 2 mm. wide below the middle, nerves apparent, obtuse at apex; petals free, deciduous, oblong in outline, 7 mm. long, 3.5 mm. wide across the middle, yellowish white, strongly nerved,

glabrous except for the woolly crinkled hairs along the margin below the middle, the upper one third laciniately dissected; ovary disk rugulose, yellow, densely pubescent, prominent; stamens at least 20, crowded about the ovary and inserted upon the rim; filaments 0.75 mm. long, finely hairy on the outer or exposed side, subterete; anther linear, fluted, 2.5 mm. long, scaberulous, 0.5 mm. thick, unequally 2-lipped at the apex, dehiscing terminally; ovary short conical, hairy; style fleshy, terete, glabrous, pale white, stigma united.

Type specimen 10825, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Collected on gentle slopes of dense forests at 3750 feet of mount Calelan. This rare and big tree species the Bagobos call also "Lanauti."

Evidently related to *E. cumingii Turcz.* and with it resembling *E. verruculosum Aug. DC.*

Elaeocarpus burebidensis Elm. n. sp.

A rather large tree; stem 6 dm. thick, 15 m. high, its main branches mainly toward the top and spreading; wood whitish, odorless and tasteless, moderately soft; bark roughened with blunt lenticels, gray and brown mottled; branchlets ascending, quite rigid, the young striate twigs covered with dull fulvous hairs. Leaves alternatingly scattered along the twigs, more or less ascending, rigidly chartaceous, flat or only the blunt obtuse to acute apex recurved, slightly shallowly folded upon the upper very dark green and sublucid surface, much paler and duller beneath, curing dull brown, margins coarsely and serrately dentate, the entire base acute to subcuneate, oblongish, with the widest portion usually above the middle, the blades 1 dm. long by 3.25 cm. wide across the middle or a trifle above it, when old glabrous on both sides, midvein pronounced beneath, finely hairy along its sides in the early state; lateral nerves 6 to 10 on each side, oblique, straight, not at all prominent, the fine reticulations very evident from both sides; stout petioles 1 cm. long or longer, soft fulvous pubescent when young, flattish on the upper side, ultimately glabrate. Inflorescent spikes ascending, yellowish green and covered with an isabellinus tomentum, stout, 3 to 7 cm. long, not numerous

from the leaf axils; flowers scattered, sparse, pendulous or nearly so, creamy yellow; pedicels yellowish green, recurved, rather stout, densely pubescent; calyx deep yellow, 10 mm. long, 3.5 mm. wide toward the base, thick, short, hairy on both sides, free, the basal portion cup shaped, the upper portion free and erect, broadly lanceolate, the inner side with a midvein; petals inserted below the disk, paler yellow, 5 or as many as there are sepals, 10 mm. long, nearly 5 mm. wide across the middle, quite thick toward the base, subpandurate, free, deciduous, densely hairy on both sides, provided on the ventral side with a thick midvein, oblongish in outline, the upper lateral and apical portion regularly divided into many linear glabrous segments 2 mm. in length, the margins in the dry state strongly rolled upon the upper side; ovary disk rugose, hairy, yellow; stamens 15, inserted upon the ovary disk; filaments subterete, finely hairy or scabrous, 2 mm. long, a trifle constricted at the distal end; anthers 3 mm. long, linear, finely scabrous, obscurely 4-angled, split at the apex into 2 unequal lips, 0.5 mm. thick, dehiscing apically; ovary short ovoid, hairy, whitish; style of the same color, terete, fleshy, gradually tapering toward the minute greenish stigma, 7.5 mm. long.

Type specimen 11837, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Only one tree of this elegant species was found on the wooded or forested ridge at 4000 feet of mount Burebid.

Elaeocarpus verticellatus Elm. n. sp.

A medium sized tree; stem 10 m. high, 4.5 dm. thick, its main branches from the middle or above it; wood whitish, moderately soft, odorless, with a slight bitter taste; bark brown, smoothish; limbs widely spreading, freely rebranched; twigs lax, terete, ascendingly curved, usually arranged in subwhorls (the central terminal one short, the lateral one or two longer), terete, smooth and glabrous. Leaves terminally crowded and appearing as in subwhorls, subchartaceous, glabrous, ascending or horizontally spreading, shallowly folded upon the dull green upper side, the blunt acute apex usually recurved, a trifle paler beneath, deciduous, obovate to broadly oblanceolate, 1 dm. long including the petiole, slenderly cuneate toward the base, greenish brown in the dry state, 3 cm. wide

above the middle, entire or only occasionally with a minute serrature; midvein dark brown especially toward the base, with about 5 lateral nerves on either side; nerves with glabrous glands in their axils, less prominent, oblique, their ascending tips coarsely anastomosing, reticulations very coarse and scarcely evident; petiole 7.5 mm. long, blackish brown, grooved along the upper side. Inflorescence immediately beneath the foliage in subwhorls, profuse; spike slender, glabrous, 5 to 8 cm. long, usually curved; flowers pendulous, slightly fragrant, deciduous, chiefly toward the distal end of the rachises; pedicels very slender, glabrous, 2 cm. long, gracefully curved; sepals free, caducous, lucid white, dull yellowish when dry, 4, ovately oblong, 8 mm. long by nearly one half as wide near the base, apex very blunt, glabrous; petals similar in color and number, subpandurate toward the base, 6 mm. long, 4 mm. wide above the middle, the basal united portion and margins woolly pubescent especially along the prominent midvein in the concavity, otherwise glabrous, coarsely veiny, the broadly rounded apical portion terminated by 5 to 7 roundish teeth; disk irregularly rugose, finely hairy; stamens erect, 20, yellowish brown; filaments 2.5 mm. long, glabrous except toward the finely or sparsely ciliate distal end, thickened toward the base; anther as long, fluted, 0.33 mm. thick, terminated by 2 unequal lips, dehiscing through the terminal slit, linear, subglabrous; ovary ellipsoid, glabrous, one third as long as the style which is 5 mm. long, slender and glabrous. Fruit bluntly ellipsoid, 1.5 cm. long, 1 cm. thick across the middle, coeruleus when ripe, very smooth and shining, its stony seed shallowly rugose.

Type specimens 12104 for flower and 12427 for fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, March and May respectively, 1910.

This very characteristic species was commonly seen along the Paualá river from 750 to 1500 feet, being more numerous at the higher altitude. In no other Philippine species are the branches, leaves and spikes verticellately arranged and in no other species do the floral parts fall so early and so easily. "Karot" is the Visayan name.

Elaeocarpus gigantifolius Elm. n. sp.

Large tree; stem over 1 m. thick and 20 m. high, not strict-

ly terete, buttressed at the base; branches mainly toward the top, crookedly rebranched and widely spreading, the ultimate ones rather slender and more or less hanging; twigs suberect, green, angular, lenticelled, glabrous, 1 to 2 cm. thick; wood light and soft, odorless, tasteless, yellowish or silvery white; bark yellowish gray, smoothish. Leaves glabrous, dull brown in the dry state, alternatingly scattered, lighter green beneath, sublucid above, shallowly conduplicate and slightly recurved, elliptic or ovately so, obtuse at the apex, broadly rounded at the base, subentire or with coarse crenate serratures, 3 dm. long, 2 dm. wide across the middle or immediately below this, occasionally much smaller or much larger; midvein yellowish green, very stout and prominent beneath, rather sharply edged; lateral nerves 9 to 13 pairs, subdivaricate, nearly parallel, less prominent, their tips usually forked and reticulately united, cross bars rather fine; petiole stout, 1 dm. long, 5 mm. thick, also glabrous, triangular in shape, flattish grooved along the upper side, a trifle curved, 1.5 dm. long, yellowish pulverulent, irregularly striate from the leaf axils mostly; pedicels relatively stout, 5 to 7.5 mm. long, glabrous; calyx squarely cup shaped, only a trifle united about the base, also glabrous, 6.5 mm. long by 3.5 mm. wide across the base, ovately oblong, quite thick, midvein more or less conspicuous on the upper side, 5, green; petals yellowish green, caducous, from below the disk, free, clawed toward the cinereous base, otherwise glabrous, widely and cuneately spreading, 5 mm. long, only 1 or 2 mm. narrower above the middle, divided to the middle into 5 to 7 segments each of which further up are again dissected into 2 to 3 fimbriate lacinae which are of a deeper yellow or brownish; hypogenous rim very large, roundly lobulate, subglabrous; stamens 40, erect, densely crowded upon the disk, yellowish; ovary short ellipsoid, subglabrous or velvety; style 1.5 mm. long, glabrous, rigid, pointed; fruit purpureus, upon 1 to 3 dm. long spikes of the branchlets below the foliage, scattered, their pedicels 1.5 cm. long, smooth, 2.5 cm. long, 1.25 cm. thick across the middle, ellipsoid or obscurely obovate ellipsoid; meat nearly yellow; stone shallowly grooved or scalloped.

Type specimen 11184, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

This magnificent large leafed species was discovered on a

very steep densely wooded embankment near a perpendicular stream cut on the overland trail along the Sibulan river at 2500 feet. The vernacular Bagobo name is "Nabol."

Elaeocarpus candollei Elm. n. sp.

A small or middle sized tree; stem nearly 3 dm. thick, 10 m. high, terete; main branches from above the middle, suberect, ultimately numerously branched; the glabrous twigs suberect, less than 5 mm. thick; wood rather soft, dingy or yellowish white, light, odorless and tasteless; bark relatively thick, gray, roughened with lenticels, otherwise melleus especially the inner side. Leaves terminally clustered, ascending, coriaceous, folded upon the upper very deep green surface, much lighter on the nether side, the obtuse to acute apex recurved, glabrous, alternate, greenish brown in the dry state, the average blade 1 dm. long by 5 cm. wide across the middle, elliptic to oblongish, entire toward the obtuse base, otherwise usually with shallow crenate serratures; midvein very pronounced beneath, reddish brown, shining; lateral pairs 5 to 7 on each side, very oblique, subparallel, tips anastomosing, also conspicuous, with minute glands in their axils, reticulations very fine and especially evident from the upper side; petiole glabrous, 3 cm. long, reddish brown thickened at both ends, caniculate along the upper side. Spicate inflorescence slightly striate, slender, more or less 1 dm. long, arising from the lowermost leaf axils; flowers pendant, odorless, their buds obovoidly elongated; pedicels stramineus, recurved, light ashy gray pubescent, at most 7.5 mm. long; calyx densely canescent on the outside, united about the base; segments 5, glabrous on the inner side and with a conspicuous midvein, 7 mm. long, nearly 2 mm. wide toward the base, lanceolately oblong, with blunt apices; petals veiny, equal in number and in length, oblong in outline, cinereous on both sides, the midvein on the upper side toward the base very prominent, inserted below the glands which snugly fit in between the margins and the midvein, 2.5 mm. wide, the upper one third pectinate and glabrous; glandular or hypogenous disk flavus, subglabrous or only sparsely strigose, large, cognately lobed; stamens 20, inserted upon the rim, straight, erect; filaments 1 to 2 mm. long, usually curved, finely hispid, subterete; anther 0.25 mm. thick, linear,

scarcely thicker than the filaments, longitudinally grooved, 3 mm. long, subscabrous, terminated by 2 very unequal lips, straight, pollen disseminating through the terminal slit; pistil green, glabrous, the ovary ellipsoid, the terete style slender and 5 mm. long, stigma very minute.

Type specimen 12974, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in shallow humus covered and well drained soil of a slightly wooded ridge at 1250 feet altitude.

This species has close affinity to *E. elmeri Aug. DC.*, but our flowers are larger, their parts different in shape and pistil entirely glabrous, not silky pubescent. Dedicated to *Dr. Aug. de Candolle.*

Elaeocarpus apoensis Elm. n. sp.

A tall tree; stem 20 m. high, 4 dm. thick, straight; limbs rigid, crooked and gnarly, the ultimate ones relatively short; wood moderately hard, not brittle, yellowish white throughout, odorless and tasteless; bark smooth, brown, that on the branches gray, the young twigs fulvous puberulent but soon becoming glabrate. Leaves chartaceous, alternate, mostly toward the end of the twigs, few, dark green above, much duller beneath, brown when dry, nearly flat, margins wavy, with widely scattering crenate serratures, apex abruptly acute or merely obtuse, base obtusely to broadly rounded, blades oblongish, the larger ones 15 cm. long, 6 cm. wide across the middle, frequently much smaller, glabrous above, puberulous on the nether side especially when young; midvein pronounced, also puberulous; lateral nerves varying with the larger or smaller blades from 4 to 8 on each side, ascendingly curved, occasionally branched from or above the middle, reticulations very fine and equally evident from both sides; the longer petioles 3 cm., becoming glabrate, subcompressed. Spikes stout and rigid, subterminal at the ends of the second year old twigs, divaricate, 5 cm. long or less, densely clothed with soft fulvous hairs, more or less striate; buds ovoidly ellipsoid, pendant, fulvous brown tomentose, with 5 yellowish brown costae; flowers pendant, possess a sourish fruit odor; pedicels 1.5 cm. long, thick, recurved, short and densely brown pubescent; sepals 5, caducous, very thick, the

dorsal side covered with a felt-like ferrugineous covering, 1.5 cm. long, nearly 5 mm. wide toward the base, lanceolately oblong, valvate, glabrous and red on the inner side, deeper red toward the apex and more glabrous toward the base; petals 5, also caducous, nearly 2 cm. long, subpandurate in outline, very thick, glabrous and with a strong midvein on the ventral surface, flesh red, strigosely hairy on the back, the upper lateral sides and apical portion cut up into glabrous filiform segments 3 to 5 mm. in length, 7.5 mm. wide at or above the middle; ovary disk large or thick, lobulately rugose, hairy; stamens erect, curvingly crowded about the ovary, inserted upon the disk, nearly 150, dull ashy brown; filament almost 2 mm. long, subteret, provided with ciliate hairs on the exposed portion; anthers subterete or fluted, 5 mm. long, fully 0.5 mm. thick, glabrous except for the ciliate hairs along the back or exposed portions, linearly pointed at the 2-lipped apex, the upper lip much longer, dehiscing through the terminal slit; pistil 10 mm. long; the hairy ovary subellipsoid; style terete, gradually tapering to the minute green apex, thinly set with hairs; fruit globose, dark green, hard, with dark or wine colored meat, fully 2.5 cm. in diameter and dark aerugineous in color when mature, the stony seed rugose.

Type specimen 10524, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

This rare species was discovered in fertile humus covered soil of a dense forested flat at 4250 feet along the trail to Baclayan. "Tapaok" is the Bagobo name.

Resembling yet very different from *E. octopetala Merr.*

Elaeocarpus laxirameus Elm. n. sp.

Tree; stem 45 dm. thick, 12 m. high or higher; branches mostly toward the top, widely spreading and crookedly rebranched, the ultimate ones very numerous and fine; twigs lax, green, suberect or curvingly drooping, glabrous, the young portion fluted; wood soft, yellowish white, odorless, with a distinct bitter taste; bark smoothish, brown, reddish beneath the epidermis, yellow on the inner side. Leaves copious, alternatingly scattered along the twigs, submembranous, ascending but the acuminate apex recurved, shining deep green on the upper folded side, paler beneath, drying pale brown, the

young ones canescent but soon becoming glabrous, base acute to subcuneate and entire, otherwise the margins are finely set with crenate serratures, elliptic or elliptic oblongish, the smaller ones lanceolate, the average blades 3 cm. long by 1.5 cm. wide across the middle; midvein quite conspicuous, reddish brown; lateral nerves 5 to 7 pairs, yellowish brown, much less conspicuous, ascendingly curved, tips reticulately united, with minute axillary glands, reticulations exceedingly fine and evident from both sides; petiole less than 1 cm. long, slender, glabrous, grooved along the upper side. Inflorescent spike arising from the terminal or subterminal leaf axils, sparse, 3 to 5 cm. long, slender, usually curved, dull silvery white pubescent; flowers pendulous, creamy white, odorless; pedicels very slender, 5 mm. long, densely grayish white pubescent; calyx nearly free or only slightly united about the base, canescent on the back, subglabrous on the central side and with a midrib, quite thick, lanceolately oblong, 4.5 mm. long, nearly 2 mm. wide below the middle, only 4; petals also only 4, a trifle longer than the sepals with which they alternate, puberulent especially along the margins, 3 mm. wide above the middle, cuneate toward the base, the apical one third dissected into 5 to 8 linear segments, from below the disk, veiny; hypogenous disk very pronounced, densely canescent, rugose, yellowish; anthers erect from the upper side of the rim; filaments averaging 0.5 mm. long, subglabrous; anther 1.5 mm. long, subterete, grooved and ridged longitudinally, subglabrous, toward 20 in a flower, very unequally 2-lipped at apex, dehiscing terminally; ovary conical, canescent or pubescent, the gradually tapering 2 mm. long style hairy at the base, otherwise glabrous. Infrutescent spikes glabrous, striate, rarely branched, slender, the 1 cm. long pedicel similar; fruits 9 mm. long by 6 mm. thick across the middle, ellipsoid or ovoidly so, smooth, hard, dark green in the young state, the older ones aerugineous green; its meat reddish, juicy and tightly adhering to the stony nearly smooth seed.

Type specimens 11945 for flower and 11222 for fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October and July respectively, 1909.

Of this laxly branched and finely leafed species only one tree was found on the wooded summit ridge of mount Burebid at 3750 feet. For both the fruiting specimen and for the flowering

specimen collected a few months later from the same tree, the natives gave me their Bagobo name as "Balintodog."

Elaeocarpus baclayanensis Elm. n. sp.

A large lofty forest tree; trunk 30 m. high, 1.35 m. thick 3 m. from the ground, straight and round, at the base buttressed; its main branches chiefly toward the top, spreading, crookedly rebranched, the branchlets numerous and quite lax; twigs less than 5 mm. thick, the young portion yellowish gray pubescent, usually ascendingly curved, relatively short; wood soft, light, silvery or maple white, toward the central mass yellowish tinged, fine for working purposes; bark smoothish, brown, thick. Leaves submembranous, similarly dull green on both sides, alternatingly clustered toward the ends of the twigs, folded above, tips slightly recurved, curing unequally dull brown, copious, oblongish, the upper side nearly glabrous except the midvein, beneath thinly pubescent, obtuse to acute at apex, base acute to subcuneate, entire below the middle, otherwise with fine crenate serratures, the average blades 8 cm. long by 3 cm. wide across the middle, frequently larger or smaller; midvein prominent beneath, canescent, finally glabrate; lateral ones much less conspicuous, 7 to 10 on each side of the midvein, oblique, forked at their ends and reticulately united, reticulations obscure, with large hairy glands in the axils of the nerves; petiole 1.5 cm. long, hairy matted along the upper flat or grooved side, otherwise becoming subglabrate. Buds ovoidly oblong, densely silky strigose, 5 mm. long; segments 5, lanceolately oblong, also appressed hairy on the inner side which has a prominent midvein, barely united at the base; petals also 5, pale white, at least as long as the sepals, oblong in outline, laciniately divided into 5 to 7 glabrous segments, the dorsal side up to the segments densely covered with silky hairs, otherwise nearly glabrous; stamens upon 1 mm. long filaments, crowded about the pistil, about 35 in number; anthers longer, also linear, minutely cleft at the apex which bears a tuft of minute hairs; ovary hairy; style rather thick, becoming gradually thinner toward the small stigma. Fruit globose like a marble, 2 cm. in diameter, dark green, glabrous even in the young state, its spikes and pedicels also glabrous, stout, ligneous.

Type specimens 10734 for flower and 11946 for fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May and October respectively, 1909; also numbers 11712 and 11414 from this same locality.

This like most all tree species in the rich, moist and sheltered mount Apo basin attains to an enormous size. It is universally known to the Bogobos as "Lanauti" although my field labels for the last numbers cited give the vernacular name as "Magsangod".

Our young inflorescence is much more densely covered with yellowish gray wool than *E. subglobosus Merr.* from Benguet province of northern Luzon.

Elaeocarpus microphyllus Elm. n. sp.

A rather large tree; stem 7.5 dm. thick, 15 m. high or higher; branches crookedly spreading from the middle, ultimately numerously branched, the glabrous and greenish twigs usually in small groups from the same point; wood moderately hard, more or less burly, white or with a slight yellow tinge, odorless and tasteless; bark smoothish or lenticelled, yellowish brown and gray mottled, rather thick, yellow on the inner side. Leaves descending, folded upon the upper darker green surface, subchartaceous, copious, alternatingly crowded at the ends of the seasonal growths, dull greenish brown when dry, the slender acuminate or subcaudate tips recurved, glabrous, obtusely rounded at the base, entire, larger blades 7 cm. long by 2 cm. wide a trifle below the middle, frequently much smaller, lanceolate or ovately oblong, margins wavy and entire or with only a few minute serratures above the middle; midvein conspicuous beneath, deep brown, smooth and shining; lateral nerves about 6 pairs, obscure, ascending, reticulately united, reculations very minute and equally visible from both sides; petioles also glabrous, slender, nearly 2 cm. long. Infrutescence apparently young, profuse along the branchlets below the foliage; spikes 3 to 7 cm. long, green and glabrous, divaricate; pedicels similarly arranged, mostly above the middle, less than 1 cm. long, terminated by a yellowish green rugose thickening; fruits ellipsoid, not exceeding 1.5 cm. in length, shining dark green with lighter green spots, about 0.75 cm. across the middle.

Type specimen 11860, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

In rich moist humus covered soil of dense forests at 4500 feet of mount Calelan. The Bagobos know it as "Magaring."

A segregate of *E. pendula Merr.*, because of its large tree size, numerous branchlets, copious leaves which are less than one half as large and not broadly rounded at the base and whose petioles are shorter. Our young fruits apparently develop to larger size and the flowers of this species are unknown. Number 11404 from this same locality is *Merrill's* species.

LEAFLETS OF PHILIPPINE BOTANY

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NEW MELASTOMATACEAE

By

A. D. E. Elmer

In this article the author only describes the new species of *Melastomataceae* segregated from his five years' collections. A good many other already known species were collected and distributed from year to year. Apo and Banahao are exceedingly rich in *Melastomataceae*. This family as a whole is very interesting and new in the Philippines, and is especially well represented in humid regions with a heavy and rather even rainfall such as on the mountains along the Pacific coast.

The following fourteen additional novelties are now held in manuscript in the herbarium, Bureau of Science, and are based upon material more recently collected than my own. Numbers 10225 from the Cuernos mountains and 11425 from mount Apo are *Everettia pulcherrima Merr.* The climbing and sprawling *Dissochaeta stellata Merr.* is now being distributed under number 8236 and was collected on the road between Lucban and Sampaloc. *Creochiton rosea Merr.* is the same as my number 10563 from the forested topotype of mount Apo at 3500 feet. In this same region I collected 11434 or *Melastoma lanaense Merr.* At Lucban, in the vicinity of mount Banahao, were gathered numbers 7440 which is *Astronia williamsii Merr.* and 7439 *Astronia meyeri Merr.* Number 11752 from the foothills of Apo is *Memecylon nervosum Merr.* My specimens of *Medinilla copelandii Merr.* are exactly as 10502 from mount Apo, the topotype. Numbers 9537 and 9435 from the Cuernos mountains, southern

Negros, are *Medinilla congesta Merr.* and *Medinilla clementis Merr.* respectively. 7630, 7457 and 8040 from mount Banahao are identical with *Medinilla disparifolia C. B. Rob.*, and were collected in similar sitios. Five years ago I discovered in this same general region *Medinilla cephalophora Merr.* and *Medinilla cogniauxii Merr.*, two numbers of the former were distributed under 7532 and 7928, and the latter under 7530. On the summit of mount Banahao was gathered *Medinilla whitfordii Merr.* and was issued under number 7592.

CREOCHITON Blm.

Creochiton diptera Elm. n. sp.

Scandent upon lofty trees; branches not numerously rebranched, terete, with brown and finely checked bark, the twigs densely umber scurfy or pulverulent. Leaves opposite, scattered, ascending, coriaceous, flat but sunken on the upper surface along the nerves, scurfily pulverulent on both sides when young, glabrous when old, diverse in size only, dull green except the lighter or yellowish green nether side, elliptic or ovately so, the entire margins slightly recurved in the dry state, curing yellowish brown, the larger blades 7.5 cm. long, 4.5 cm. wide across the widest portion, usually the uppermost ones smaller, quite rigid, apex rounded or obtusely rounded, frequently a trifle emarginate, base broadly rounded; midvein bold beneath, sunken above, densely umber scurfy, finally glabrate; lateral veins 2 pairs, the basal pair arising 2 mm. from the base and extending below the margin to above the middle of the blade, the more conspicuous and upper pair arising 5 mm. from the base and curvingly extending clear into the apex, cross bars rather numerous and quite evident from beneath; petiole similarly scurfy, when old nearly glabrous, varying from 5 to 20 mm. long, terete. Inflorescence divaricate and subdeflexed from the leaf axils, upon a 2.5 cm. long scurfy peduncle; pedicels of the 3 flowers about one third as long as the peduncle but which elongate with the maturing of the fruit; subtending bracts sessile, yellowish and pulverulent, roundly cordate, erect, 2; calyx yellowish green; corolla whitish, spreading, usually with 4 petals; pistil pink; anthers deep purple or indigo

except the light cream colored basal tip; filaments of the same color as that of the basal portion of the anther tips.

Type specimen 9813, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, April, 1908.

Only a few specimens were secured at 4000 feet altitude. "Buyon-buyon" is the local Visayan name.

DISSOCHAETA Blm.

Dissochaeta subviridis Elm. n. sp.

Scandent and overtopping small trees and thickets; stem soft, 2.5 cm. thick; wood yellowish, porous; bark comparatively thick, longitudinally checked, also yellowish; branches slender, drooping, finely rusty brown scurfy, terete or nearly so. Leaves oppositely scattered along the branchlets, divaricately spreading, flat except the recurved slenderly acuminate tips, thinly coriaceous, glabrous and dull green above, the nether side whitish or glaucescent, curing dull green on both sides, when young the lower side appears somewhat reddish due to the scales, brown scurfy along the veins and cross bars, otherwise stellately white pubescent, ovately oblong, base broadly rounded, the average blades 1 dm. long by 4 cm. wide toward the base, the entire margins minutely involute in the dry state; midvein conspicuous beneath, fuligineus scurfy, the lateral pair arising from the base and gracefully curved, the submarginal line present, cross bars relatively bold, finely scurfy; petiole 1.5 cm. long, similarly scurfy, ultimately becoming glabrate. Inflorescence terminal, drooping, paniculate, 1 to 2 dm. long, fuligineus, all the stalks striate, the secondary branches divaricate and usually subtended by broad bract vestiges; pedicels 3 to 5 mm. long; calyx urceolate, 5 mm. long, 3.5 mm. wide, minutely and densely scurfy brown, bearing an obscurely 4-lobed glabrous rim; petals 4, thick, elliptically oblong, 5 mm. long, 3.5 mm. wide, deep pink, strongly recurved, glabrous, doubly curved, 4 mm. long, subterete; anthers light yellow at apex, brownish yellow toward the base, inflexed in the bud state 3.5 mm. long, excluding the thin brown linear 2 mm. long truncate pair of basal appendages, stipitate, linearly oblong, on the dorsal side at the base of the stipe merely mucronate; style red, terete,

4 mm. long, stigma very minute; fruit with the persistent calyx rim, ovoidly globose or merely globose, sweet, juicy, deep blue, brown puberulent; seeds numerous, pale yellow except the nearly black edge, 0.75 mm. long, subclavate.

Type specimen 10577, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

In good soil of moist woods at 3500 feet south of mount Calelan. "Tolasola" is the Bagobo name.

D. cumingii Naud. has 8 stamens; *D. celebica Blm.* only 4. Ours therefore is nearest to *Blume's* species and differs from it in having larger calyx, petals twice as long, larger leaves whose shape is always ovately oblong rather than oblong and always visibly green beneath even in the young leaves.

MELASTOMA Burm.

Melastoma congesta Elm. n. sp.

Erect shrub; stem 5 cm. thick, 3 to 4 m. high, branched from near the ground; wood odorless and tasteless, soft, greenish white, with a large pith; bark smooth, brownish; main branches slender, ascending, few branched toward the ends; twigs angular, avellaneous scale covered. Leaves opposite, descending, chartaceous, folded upon the upper deeper green surface, when dry dull brown on the upper hispid surface and yellowish green on the short pubescent lower side, the entire margin subinvolute, exceedingly unequal in size, the lower or the larger blades nearly 15 cm. long by one half that across below the middle, gradually tapering to a sharp acute point, base broadly rounded, ovately oblong; midvein prominently raised and scaly beneath; lateral veins of 2 pairs, arising from the base, similarly prominent and scaly, the lowermost pair finer and submarginal; cross bars numerous, parallel, yellowish green, conspicuous, hairy; petiole 1 to 1.5 cm. long, covered with diverse finely ciliate scales, usually with interaxillary bracts. Inflorescence terminal, erect, congested, subtended by a pair of small leaves or merely by bracts; peduncle stout, short, angular, densely clustered, with sharply pointed bracts; pedicels similar though shorter, subtended by a pair of caducous rather oblong bracts 1.5 cm. long; calyx tube 1.5 cm.

long, 1 cm. thick, densely covered with slenderly lanceolate grayish green scales whose margins are finely ciliate, with 5 broadly lanceolate teeth; these are at least 1.5 cm. long, nearly 1 cm. wide toward the base, subglabrous and reddish on the inner side, the median dorsal region covered with similar scales as the calyx itself, much less so toward the edge which bears ciliate hairs; petals 5, rose red, early falling, 2.5 cm. long, obovate, bearing a small beard at the apex; stamens 10, in 2 unequal series; filaments subequal in length, 1 cm. long, glabrous, yellowish, fleshy; the anthers of the lower or shorter series bright yellow, strongly curved, as long as the filaments, basifixed, with 2 small auricular lobes on the sides at the base, tapering to a fine point; anthers of the upper or the longer stamens somewhat longer and thicker, less curved, purplish red, the basal portion of the anther sacs obscurely lobed and set upon a 7.5 mm. long strongly curved stipe which at the base bears a pair of short spurs or appendages; style terete, red, also glabrous, bearing a green stigma.

Type specimen 12402, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

On the slopes of hills covered with grasses and shrubs in well drained red compact soil at 750 feet. The Visayan on Sibuyan call it "Rosas-de-Japon".

The leaves and calyx at once distinguish it from *M. fuscum Merr.*

MEMECYLON Linn.

Memecylon gitingense Elm. n. sp.

A small tree; stem 1.5 dm. thick, terete, 8 m. high, branched from the middle; wood moderately hard and heavy, brownish toward the center, odorless and tasteless; bark comparatively thin, dull brown, finely shredded or checked; branches widely spreading, ultimately and laxly rebranched, glabrous, reddish brown, thin, terminal ones very fine. Leaves opposite, copious, scattered along the branchlets, descending, thinly coriaceous, glabrous, curing subviridis, curvingly folded upon the upper side, recurved toward the very slender acuminate apex, base broadly cuneate, margins entire, the largest blades 5 cm. long by 2 cm.

wide at the middle, elliptically oblong or ovately lanceolate, midvein evident, lateral ones none; petiole 5 mm. long, glabrous, yellowish brown. Infrutescence 1 to 3-clustered from the leaf axils; peduncles 5 to 8 mm. long, green, glabrous, crooked, few jointed or occasionally with 1 or 2 short branches, usually bearing only 1 fruit; pedicel shorter, very similar and forming the uppermost joint; fruits equally flattened at both ends, otherwise globose, less than 1 cm. in diameter, with a circular scar at the apex, yellowish, roughened in the dry state, whitish when fresh and mature; seed crustaceous, with greenish convoluted cotyledons.

Type specimen 12189, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, April, 1910.

Discovered in clay soil with a gravelly subsoil on the wooded banks of the Sinuban creek at 750 feet. "Anaba" is the local Visayan name.

Related to *M. gracilipes C. B. Rob.*

Memecylon odoratum Elm. n. sp.

Strictly erect shrubs; stem 2 to 3 cm. thick, 1 to 2 m. high, solitary or clustered, branched toward the top only, terete; wood quite hard, brittle, with a strong sweet odor; bark smoothish, grayish white; branches rather few, erect, rebranched, terete, the ultimate portion very smooth and yellowish white. Leaves opposite, heavy, rigidly coriaceous, erect, flat, glabrous, brown on the upper side and yellowish on the lower side when dry, the entire margin subrecurved, apex rounded or bluntly obtuse, occasionally faintly emarginate, base subcuneate, oblong or obovately so, the larger blades 8 cm. long by one half as wide across the widest portion, frequently smaller; midvein prominent, grooved above, the divaricate lateral nerves few and very faint or obsolete; petiole yellowish green, glabrous, 5 mm. long. Inflorescence in fascicles along the branchlets; pedicles glabrous, 2 mm. long, subtended by profuse bracts; calyx 2.5 mm. long, campanulate, about as wide across the obscurely 4-apiculate rim; petals blue, 2 mm. long, ovately oblong, apex sharply pointed, at the base broad and abruptly constricted into a short claw, the basal sides occasionally ending into lobules and appearing hastate; stamens 8, all fertile; filaments 2 to 3 mm. long, somewhat

compressed toward the base, glabrous; anther 1.5 mm. long including the pair of 0.5 mm. long basal tails, curved, sagittate, the upper ventral side pale yellow, otherwise purplish; style terete, 4 mm. long, with a small stigma.

Type specimen 13140, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This *Memecylon* with sweetly scented wood is not uncommon in sand gravelly soil among other shrubs and small trees along a creek at 500 feet altitude, between the forks of the Iwahig river. This and *Diplycosia sessile Elm.* were seen only along this water course winding its way through a rather level tract of woods.

Distinct from *M. sessilifolium Merr.*

Memecylon palawanense Elm. n. sp.

A small crooked tree; stem gnarly, 1.5 dm. thick, 7 m. high, ascending and extending over the river bed, branched toward the top only; wood dull brown especially toward the center, quite hard and heavy, odorless and tasteless; bark relatively very thin, brown except the gray usually checked surface; main branches not long but crookedly spreading, numerously rebranched; twigs slender, somewhat drooping, lax, the subterete glabrous terminal portion green. Leaves oppositely scattered along the branchlets, glabrous, curing greenish, ascending, entire, recurved toward the obtuse apex, somewhat folded on the upper deeper green surface, much paler or yellowish green beneath, the larger blades 5 cm. long and one half as wide across the middle, base acute, subelliptic or lanceolately oblong or fusiform; midvein very prominent beneath, grooved along the upper side, lateral nerves absent; petiole glabrous, 5 mm. long; axillary hairs brown, short and few. Inflorescence from the old leaf axils along the branchlets, in short cymose or nearly umbellate clusters, 7.5 mm. long; peduncle glabrous, very short, usually bracteate; secondary stalks or pedicels as long or shorter, also subtended by bracteoles; calyx turbinate in flower, urceolate in the fruiting state, yellowish green, glabrous, 2.25 mm. long, shallowly 4-dentate; petals purplish blue, also 4, sharply pointed in the bud state, ovately oblong, 2 mm. long, 1.5 mm. wide, truncate at the base, the sides below the middle with few sinuate folds or hastate lobes; fertile stamens 8; filaments curved, bluish white, glabrous, 2 mm. long, subterete,

thickest across the middle, anther 1.5 mm. long, 0.5 mm. wide, dorsifixed, transversely attached, the sides below the middle folded, that portion above the filaments and on the lower side dehiscing and usually wider from the side view; style terete, 3 mm. long, at the minute apex slightly narrowed.

Type specimen 13235, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered in wet earth among rocks on the wooded Iwahig river bank at 1000 feet altitude. Rare!

To be compared with *M. lanceolatum Cogn.*, but not the same as 232 *Foxworthy* from Borneo.

Memecylon terminaliflora Elm. n. sp.

Lax, suberect undershrub; stem 3 to 4 m. high, 2.5 cm. thick, terete, branched from below the middle; wood latericius except the very thin lighter brown sapwood, odorless and tasteless, moderately solid; bark smooth, greenish to yellowish gray or brown, very thin; main branches widely spreading and curved, sparingly rebranched, the twigs very slender and drooping, the glabrous and green portion winged. Leaves opposite, scattered, subchartaceous, horizontally spreading, glabrous, much lighter green beneath, flat with acute to acuminate tips recurved, base broadly rounded and emarginate or subcordate, entire, dull green and paler so beneath in the dry state, the larger ones 2 dm. long by 6 cm. wide below the middle, oblong or ovately oblong, gradually tapering to the apex; midvein prominently raised beneath, sunken along the upper side, straw brown; lateral pairs similar, 9 to 13 on a side, divaricate, subparallel, united into a prominent submarginal vein; reticulations coarse and very obscure; petiole stout, only 3 mm. long, glabrous. Inflorescence odorless, suberect or descending, terminal or from the uppermost leaf axils, usually solitary; the peduncle green, glabrous, slightly compressed and grooved along the edges, 2 to 3 cm. long, quite slender, umbellately branched at the distal end; secondary peduncles puberulent, otherwise similar, subtended by bract vestiges; flowers umbellately clustered, subtended by similar bracteoles; pedicels about 2 mm. long, slender and glabrous, straw colored; calyx turbinate or saucer shaped toward the truncate rim, stramineus; petals cyaneus,

4, obovately oblongish or quite irregular in shape, caducous, reflexed, 1.5 mm. long, stamens 8; filaments equal and inserted upon the calyx rim, bluish purple, glabrous, 1.5 mm. long, usually curved, subterete; anther also curved, 1 mm. long, oblongish, cyaneus on the back which extends beyond the attachment of the filament and outwardly curved, the ventral side dehiscing and pale yellow; style also yellowish, glabrous, strict, terete, 2 mm. long, apex rather sharply pointed.

Type specimen 13060, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in moist fertile humus covered soil of dense forests at 750 feet elevation and on the trail across the range to Napsan on the west coast.

It belongs in the same group with *M. paniculatum Jack* and *M. nervosum Merr.*

Memecylon apoense Elm. n. sp.

A rather small tree; stem 1.75 dm. thick, 7 m. high or higher, branched from below the middle; wood hard, whitish, odorless and tasteless; bark brown or mottled with gray, smooth; branches rather long and freely rebranched, divaricate, the ultimate ones green, glabrous and subterete, brown when dry. Leaves spreading horizontally or descending, leathery, shining deep green on the upper side, much paler or lighter green beneath, glabrous, the recurved tips abruptly acuminate, otherwise flat, the entire margins subinvolute in the dry leaves, elliptic to ovately elliptic, 15 cm. long by 7.5 cm. wide, the terminal ones usually much smaller, drying dull green, base broadly obtuse or rounded; midvein very pronounced beneath; the 9 to 11 lateral pairs of nerves very obscure, subparallel, divaricate, united into a submarginal line, reticulations none; petiole very stout, less than 1 cm. long. Inflorescence from the uppermost leaf axils or from the branchlets; peduncle strict, glabrous, green, angular or grooved on the 2 edges, 1 to 3 cm. long, suberect, occasionally 1 or 2-branched; flowers umbellately fascicled; pedicels strict, 3 mm. long, also glabrous, subtended at the base by rim-like subpersistent bracts; calyx bowl shaped, glabrous, 5 mm. high and as wide across the truncate rim at the apex, pinkish; petals 6 mm. long, a trifle narrower, thick, pale red, apiculate, rotund or broadly

elliptic, base quite broad and leathery, deciduous; filaments 3 mm. long, subcompressed toward the base and narrowed toward the distal end, glabrous, azure blue; anthers of the same color, the basal two thirds extended into an ascendingly curved rather sharp point, dehiscing along the upper ventral side, 2.5 mm. long; the filaments attached to above the middle, the side below it folded, at least 1 mm. thick across the top; style glabrous, 5 mm. long, terete, gradually tapering from the base to the small stigmatic point, whitish at the base, bluish toward the tip.

Type specimen 11697, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

This species inhabits fertile humus covered soil of deep woods or forests of the mount Apo basin at 4000 feet altitude. "Malabasag" is the Bagobo name, and its flowers are noted as being sweetly fragrant.

Probably most resembling *M. edule Roxb.*

Memecylon sorsogonense Elm. n. sp.

Shrub, 3 to 5 m. high, the slender and sparingly rebranched branches horizontal or reclining over adjoining shrubs; twigs glabrous, green, angularly winged. Leaves opposite, sessile, glabrous, thick and very rigid, entire, ovately oblong, curing brown, the average ones 2.5 dm. long by 1 dm. wide below the middle, gradually tapering to the bluntly obtuse apex, base cordate; midvein dark brown in the dry state, prominent beneath; lateral pairs 9 to 13, ascending, similar in color but much less prominent, subparallel, frequently alternating with secondary ones, interarching and forming a conspicuous submarginal line 5 to 7.5 mm. from the edge, the few and coarse reticulations quite obscure and mainly at the distal ends of the secondary nerves. Inflorescence terminal or from the uppermost leaf axils, about 7.5 cm. long, twice as long in the fruiting state; peduncle glabrous, grooved along the sides, less than 5 cm. long, umbellately branched at the distal end; branches striately angular, very unequal in length, the longer or terminal ones usually again branched in a similar manner, subtended by sharply pointed deciduous bracteoles; pedicels of numerous flowers very slender, glabrous, 2 mm. long, subtended at the base by a minute rim of bract vestiges; calyx reddish blue, glabrous, broadly turbinate, 2 mm. high,

0.5 mm. wider across the truncate apex; petals lividus, coriaceous, caducous, truncately short ovate, 2 mm. long, nearly as wide across the base, 4; stamens 8; filaments twistingly curved, subterete, 2 mm. long, narrowed toward the apex, lilacinus, also glabrous, terete; style 3 mm. long, pointed toward the small stigma; all the stalks in the fruiting state twice as long; fruits atroviolaceus, globose, shining, 7.5 mm. long or in diameter, bearing a small calyx rim, more or less streaked vertically.

Type specimens 7310 in flower and 7361 in fruit, *A. D. E. Elmer*, the former from Sorsogon, southern Luzon, November, 1905; the latter from Palo, Leyte, January, 1906.

These two type numbers are exactly the same species, and in my opinion can well be segregated from *M. preslianum Tri.*

ASTRONIA Blm.

Astronia lucbanensis Elm. n. sp.

A tree-like shrub, 4 m. high; wood moderately soft, dull white, easily breaking; bark mostly smooth, grayish white and mottled; branches numerous, quite rigid, the obscurely angled twigs light brown scurfy. Leaves leathery, opposite, chiefly toward the ends of the twigs, glabrous on the strongly conduplicate upper side, much lighter green beneath, the young ones glaucous at least on the lower more or less scurfy side, entire, elliptically oblong or fusiform, gradually tapering toward the recurved acuminate apex, base obtuse or subcuneate, the average blades 1.5 cm. long by 6 cm. wide across the middle, curing blackish brown; veins 3 from the base, the midvein stouter, also with submarginal lines, the lateral pair arising from near the base, brown scurfy even in the old leaves; cross bars also very conspicuous from beneath, similarly brown and scurfy, reticulations faint or obsolete; petiole 2 cm. long, scurfy at first, ultimately glabrous, shallowly grooved above, quite stout; stipular bracts lanceolately oblong, varying 1 to 2 cm. long, densely covered with fine olivaceously colored scales. Panicle terminal, erect, when in anthesis 1 dm. across; peduncle stout, one half as long or less, scurfy, subtended by bracts; secondary branches densely covered with olivaceous scales, subtended by bract vestiges or ebracteolate; pedicels few mm.

long, thick, scaly brown, calyx subglobose, 2.5 mm. high, 1 mm. wider, similarly scurfy, 5-dentate; petals reddish yellow, 5, caducous, alternating with the calyx teeth and strongly reflexed, smooth, ovately elliptic or subrotund, 1.5 mm. long; stamens 10, all alike; filaments scarcely 1 mm. long, very broad especially toward the base, glabrous; anther cells upon the inner side of the fleshy short ellipsoid 1 mm. long glabrous connective which is attached to the filament from its side; infrutescence copious, flatly paniculate, 1.5 dm. across; all the branches glabrous, pedicels slender, 3 mm. long; fruits few clustered, flatly globose, with a cupular rim, glabrous, dry, dull brown, becoming shredded from the apex toward base; seed minute, linear, shining, broadest toward the base, one side nearly black, the balance light straw brown.

Type specimens 7807 for flower and 7448 for fruit, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

Discovered in wooded ravines at 2000 feet of mount Banahao.

Astronia gitingensis Elm. n. sp.

Suberect tree; stem terete, 2 dm. thick, 5 to 8 m. high; wood hard and heavy, dingy white or reddish toward the center, without odor or taste; bark yellowish gray, scaling in longitudinal plates; branches mainly toward the top, forming a rather dense small crown; twigs suberect, the ultimate portion obscurely angled and finely latericius, felty. Leaves opposite, chiefly toward the ends of the branchlets, horizontal, the terminal ones suberect, rigidly chartaceous, usually folded upon the upper side which is very dark green, paler beneath, curing dull green, when old glabrous, in the early state both sides but especially beneath covered with latericius or reddish brown scales, entire margins subrecurved in the dry state, obtuse or subcuneate at the base, gradually tapering toward the acute or acuminate recurved apex, fusiformly oblong, the average blades 7.5 cm. long by 3 cm. across the widest portion; midvein very prominent beneath, scurfy at first, the lateral pair arising 3 to 5 mm. above the base and gracefully arching into the apex, the submarginal line faint; cross bars quite evident between the midvein and the lateral ones, straight, about 10 on a side, divaricate, parallel; petiole at first similarly

scurfy, ultimately glabrous, 1 cm. long more or less, usually with interaxillary bracts. Inflorescence terminal and erect, densely scurfy with fine latericius scales, subtended by small leaves, paniculate, less than 5 cm. long, usually exceeded by the foliage; peduncle only 1 or 2 cm. long, stout, angular; branches similar, very shortly rebranched above the middle; pedicels 1 to 2 mm. long, thick and scurfy, subtended by bract vestiges; calyx subglobose, 3 mm. across, similarly scurfy, at least 5-apiculate; petals also 5, caducous and reflexed from between the calyx teeth, yellowish, 2.5 mm. long, short obovate; stamens 10; filaments 1 mm. long, much compressed, glabrous; anther sacs on the outer edge of the irregularly shaped and somewhat compressed 1 mm. long connective.

Type specimen 12518, *A. D. E. Elmer,* Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

Collected in wet clay mixed with stones on a densely wooded ridge at 4750 feet of mount Giting-giting.

Not *A. rolfei Vid.* from description, more closely to *A. cumingiana Vid.*, yet sufficiently distinct. The difference between *Vidal's* two species is not clear to me.

Astronia viridifolia Elm. n. sp.

A slender and erect tree; stem 12.5 cm. thick, 5 m. high, its main branches arising from below the middle; wood dingy or yellowish white, odorless and without taste; bark thin, yellowish, flaking in thin scales; the lower branches ascending, numerously rebranched, the ultimate ones relatively short, subhorizontal, repeatedly branched from the lower side, with ascending leafy tips, the young portion finely yellowish gray pulverulent. Leaves gracefully recurved, mostly descending, thinly coriaceous, flat or only shallowly folded upon the velvety dark green upper surface, gradually tapering into the sharply acuminate point, entire margins subinvolute in the dry state, curing light green beneath and darker so above, glabrous, base subcuneate, the average blade 1 dm. long by 3 cm. wide across the middle, pointedly oblongish or sharply fusiform; midvein yellowish brown, sublucid and conspicuous beneath, the lateral pair from the base to apex, cross bars and submarginal line very faint; petiole 2 to 3 cm. long, slender, dark colored when

dry, glabrous, grooved along the upper side. Inflorescence erect, terminal, subcorymbose; peduncles usually 3, finely yellowish gray scurfy, subtended by a pair of small leaves, branched from above the middle; branches short, rebranched at their ends, similarly scurfy, subtended by vestiges of bracteoles; pedicels 1 mm. long, relatively thick, latericius scurfy; calyx 3 to 4 mm. across, subglobose, minutely scurfy, 5-toothed; petals 5, reddish, oblong or obovately so, caducous, in the bud state imbricately folded, reflexed when in anthesis especially so toward the base, at least 1 mm. long; anthers orange red, compressed, irregular in shape, 1 mm. long, dehiscing on the outer angled side.

Type specimen 12281, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, April, 1910.

Gathered in moist reddish soil of wooded banks along the Patoo river at 1000 feet. The Sibuyan natives know it as "Coycanigag."

Quite distinct from my previous species and *A. subcaudata Merr.* in herbarium, Bureau of Science.

Astronia cuernosensis Elm. n. sp.

Strict tree, 5 m. high; wood soft, whitish, covered with brown bark; branches numerous, forming an umbrella shaped crown; twigs relatively short, ascending, angular, glabrate except the young tips which are reddish brown pulverulent. Leaves glabrous and very dark green on the upper surface and ater brown when dry, fulvus or yellowish brown pulverulent beneath even so in the dry state and finally becoming glabrate, coriaceous, entire margins slightly recurved, the rather abrupt and sharply acuminate apex recurved, base bluntly obtuse, elliptically oblong, variable in size, the larger blades 7.5 cm. long by 3 cm. across the middle, copious; midvein prominent beneath, reddish brown, the lateral pair arising 3 mm. from the base and gracefully curving clear into the apex, cross bars between midvein and lateral ones about 10 on each side; petiole 1 cm. long, ultimately glabrate, caniculate on the upper side. Young infrutescence latericius, terminal, erect, sparingly branched or spicate, 5 cm. long, the rachis angled and grooved on the sides; branches few, short, opposite or in subwhorls, more

numerous toward the top; pedicels 2 mm. long; young fruits nearly 3 mm. across, subglobose, apex truncate and obscurely dentate.

Type specimen 10234, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, June, 1908.

On a wind swept moss laden humid knoll at 4000 feet.

Quite different from the description of *A. pulchra Vid.*

Astronia ferruginea Elm. n. sp.

Small tree; stem 1.5 dm. thick, 7 m. high; wood moderately soft, sappy white, without odor or taste; bark brown, scaling in thin plates; branches from above the middle, ascending, the ultimate ones short and crooked, quite thick, the young portion covered with ferrugineously colored scales and obscurely angular. Leaves opposite, mainly toward the ends of the twigs, horizontal or ascending, coriaceous, gradually tapering to the recurved acuminate apex, base broadly obtuse, the entire margin slightly recurved, glabrous and dull green above, nearly castaneus when dry, the young ones covered with ferruginous scales, quite variable in size, the larger blades 1.5 dm. long by 5.5 cm. wide across the middle or a trifle below it, ovately oblong or the smaller lamina broadly lanceolate, the lower surface at all times covered with richly colored ferruginous minute scales; midvein prominently raised beneath, darker ferruginous; the lateral pair arising from the base and curving into the abruptly constricted spine-like tip, the submarginal line distinct, also darker ferruginous; cross bars prominent, with reticulations rather plain; petiole 2 cm. long, similarly scurfy but finally glabrate, flattened along the upper side. Infrutescence short paniculate or subcorymbose, ascendingly branched from the base or near it, the secondary stalks freely rebranched above the middle, all angular and dark rusty brown; fruits clustered toward the ends chiefly, many, upon 3 mm. long similarly scaly pedicels, subglobose, 4 mm. in diameter, the truncate apex crowned by 5 persistent teeth; seeds numerous, 2 mm. long, clavate, light straw brown except the dark brown side, dry.

Type specimen 11426, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Along wooded streamlets at 5500 feet on the east slope of mount Apo.

Possibly ours is nearest related to *A. calycina Vid.*

Astronia apoensis Elm. n. sp.

A tree-like shrub; stem 5 to 7 m. high, 1 dm. thick; its branches mainly at the top, ascending, few, sparingly rebranched; twigs erect, 2.5 cm. thick, green, more or less square; wood soft, whitish, without odor or taste; bark yellowish brown, checked. Leaves coarse and large, flat, ascending, oppositely scattered every 7 to 12 cm. apart, heavy, coriaceous, glabrous except the veins and nerves beneath, dark green and lucid above, much paler beneath, only the blunt acute tips recurved, entire margins rolled in upon the lower side after being dry, curing yellowish green above, beneath much duller, lamina 3 dm. long by 14 cm. wide across the middle, oblong or rather elliptically so, equally tapering from the middle toward both ends, giving it a fusiform shape, broadly acute or obtuse at the base; veins 7 from the base, the midvein stoutest, the lowest pair least conspicuous and submarginal, all more or less sunken on the upper side, brown pulverulent scurfy but nearly glabrate in age especially the largest ones; cross bars very conspicuous and reddish scurfy beneath, sunken on the upper side, the secondary cross bars also present; petiole ascending, green, succulent, very stout, 1 dm. long, glabrate, deeply channelled along the upper side, the edges fringed with soft coarse hairs; axillary beard large and cremeus colored. Peduncles usually 3, more or less recurved from the upper leaf axils or terminal, 1.5 dm. long, green, angular and grooved on the sides, more or less light brown lenticelled; pedicel 2 to 3 mm. long, puberulent; calyx similarly fine scurfy with reddish scales, urceolate, 5 mm. high, nearly as thick below the middle, its rim roundly 4-lobulate; petals yellowish, glabrous, 4, short obovate, 3.5 mm. long; stamens 8, equal; filaments 1.5 mm. long, much compressed, glabrous; anther sacs upon the outer curved portion of the thick irregularly shaped or oblongish connective; style terete, very thick, 4 mm. long, yellowish, bearing a flattened capitate greenish stigma; fruiting panicle green, 3 dm. across, nearly as high, the secondary branchlets freely rebranched from the middle, all the stalks somewhat compressed and shallowly

grooved, only slightly pale yellow puberulent; pedicels subterete, 7.5 mm. long, usually curved, few to several clustered; fruits glabrous, dirty brown when dry, flatly globose, 7.5 mm. across, less in height, bearing the expanded 5-toothed persistent calyx rim; seeds numerous, 2 mm. long, linear though gradually tapering from end to end, light brown with a darker brown portion.

Type specimen 11427, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Found in a depression along a very moist wooded streamlet at 5500 feet on the eastern slope of Apo. The vernacular Bagobo name is "Bagobo."

MEDINILLA Gaud.

Medinilla benguetensis Elm. n. sp.

A bushy and subscandent shrub; branches tough, grayish brown, ultimately numerously rebranched, the green terminal portions glabrous; nodes numerous, quite large, 1 to 2 cm. long. Leaves shining green on both sides, opposite, scattered, subsessile, diverse in size, leathery, drying dull green, the petiole region pink, entire, usually recurved toward the obtuse or acuminate apex, base broadly rounded, the larger ones 4 cm. long, nearly 2 cm. wide across the base, quite sharp, varying from orbicular to lanceolate, normally ovate or ovately oblong, midvein evident, lateral ones obsolete; axillary hairs brown, minute, caducous. Infrutescence terminal, subpendant, 1 to 3 cm. long, sparingly paniculate; all the stalks slender, green even in the dry state, glabrous, winged, the branchlets subtended by bracteoles, the pedicels 5 mm. long; fruit subglobose except the articulate and stipitate base, subtended by a pair of bracteoles, 7.5 mm. across, with a small rim at the apex, reddish blue and really soft when mature, glabrous and shining; seeds many, straw brown, 1 mm. ong, more or less clavate in shape.

Type specimen 8435, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1907.

Gathered from limestone cliffs at 5000 feet. Rare, and is only known by my collections made in 1904 and 1907.

Medinilla crassata Elm. n. sp.

Shrubby; branches tough, terete, freely rebranched, branchlets more or less angular, the twigs compressed and usually between the nodes broadly winged, nodes rather numerous, all parts glabrous. Leaves in opposite pairs, smooth, glabrous, very thick and turning blackish brown when dry, recurved toward the slender acuminate point, paler green beneath, easily breaking, entire, lanceolate to lanceolately oblong, base acute to obtuse, the larger blades 7.5 cm. long by 2.5 cm. wide just below the middle; midvein conspicuous beneath, glabrous, reddish, lateral pair of veins arising from near the base, less prominent, confluent with the midvein at the base of the apical point, cross bars obsolete; petiole 1 cm. long or less, glabrous, red; axillary hairs maroon colored, very short, deciduous. Infrutescence 1.5 dm. long, very slender; the drooping peduncle arising from the apex of the twigs, nearly 1 dm. long, subtended by bracteoles; fruits few clustered at the ends of the ultimate branchlets, red, ultimately soft and dark brown or nearly black, globose, 7.5 mm. in diameter, with an apical rim; pedicels 1 to 1.5 cm. long, gradually thickened toward the distal end; seeds numerous, brown, 1 to 1.5 mm. long, gradually thickened toward one end, sublucid.

Type specimen 9311, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

In dry or well drained soil of shaded woods at 2000 feet of mount Banahao. Rare!

Medinilla aurantiflora Elm. n. sp.

Shrub, 4 to 5 m. high; branchlets terete, yellowish gray and roughened with brown lenticels, the young green portion covered with stramineus hairs; wood soft, reddish, with a slight fetid odor; bark on the stem brown and deeply checked. Leaves coriaceous, spreading, dull green above, yellowish so beneath, with only a few unequal opposite pairs, obovately oblong, pandurate at the base, abruptly terminating into the short sharply acuminate point, dark murinus in the dry state, entire, the larger leaves 2 dm. long by 9 cm. wide above the middle; their opposed leaves proportionate in shape but only slightly more than one

half as large, subsessile, with auriculate lobes at the base; midvein very large toward the base and usually provided with crisp whitish hairs, ultimately glabrous; lateral main pairs of veins 3, the finer or basal pair arising 2 cm. from the base and marginally curving to above the middle of the lamina, the middle pair at least 4 cm. from the base and curved to near the apex, the uppermost pair 7.5 cm. from the base and confluent with the midvein in the apex, cross bars faint yet quite evident from both sides; axillary hairs 5 mm. long, soft, light straw brown. Inflorescence from near the base of the stem or stems, clustered on gnarly ligneous tubercles 1.5 dm. long, more or less branched, the ultimate ones ascendingly curved; rachis of the spikes flexible, green and lenticelled, compressed, glabrous, flower bearing toward the distal end or one half; flowers imbricately subtended by glabrous elliptically oblong bracts; pedicels also glabrous, 5 mm. long, subterete, constricted toward the base, subtended by an erect linearly ultimately recurved bract; calyx slightly longer, obscurely angular, the 3 mm. deep rim truncate or broadly 5-apiculate and faintly 5-nerved, also glabrous; petals 4 or 5, about 10 mm. long, very delicate, aurantiacus or orange red, oblongish, 3.5 mm. wide, irregularly truncate at apex, base very broad, veiny; stamens 10; filaments 6 mm. long, dilated and toward the base adnate to the corolla, yellowish; anthers 3.5 mm. long, a trifle curved, yellow, elongate, the dorsal side with a slender 1.5 mm. long spur, dorsifixed, with a pair of thick ascendingly curved pair of spurs; style terete, likewise glabrous, 9 mm. long, terminated by a small capitate stigma, curved mainly toward the top; ovary conical and glabrous.

Type specimen 9934, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, April, 1908.

Gathered from wet seepage cliffs at 3000 feet altitude along the Bonyao river. Rare, and was called by the local Visayan "Hogno-pili-pagon."

It is closely related to *M. cauliflora Merr.* from the same island. Our leaves are larger with different bases and drying blackish brown. There are also minor floral differences.

Medinilla calelanensis Elm. n. sp.

Shrub; stem 5 cm. thick, 3 to 4 m. high, branched from

below the middle; twigs ascending, terete, only the green young portion glabrous and angled; wood sappy white, moderately soft without odor or taste; bark yellowish gray, finely checked. Leaves rigidly coriaceous, very deep dull green above, glabrous, entire margins sharply edged, elliptically oblong or obovately oblong, 10 cm. long, one half as wide across the middle or a trifle above it, abruptly coming to a sharp acute point, base obtuse or broadly cuneate, curing very dull brown on both sides; midvein thick toward the base, with only 2 primary lateral pairs of veins, the basal pair arising 5 mm. from the base and extending nearly to the apex of the lamina, the upper pair 2 cm. from the base and usually united with the midvein at the base of the apical point, cross bars very faint and only visible from the upper side in the dry state at least; petiole very thick and rigid, flattened, 5 mm. long, glabrous; axillary hairs persistent, about as long, yellowish brown. Inflorescence ascending, rigid, terminal, 5 to 8 cm. long, sparingly branched from the middle; peduncle angular and winged, reddish, strict, branches similar, brighter red; pedicels 1 cm. long, articulate, pink; calyx reddish, nearly 1 cm. long, suburceolate, the truncate rim slightly expanded; petals pink, broadly elliptic, 1 cm. long at least, 5; stamens 10, smooth and glabrous, inserted upon the calyx rim, incurved in the bud state; filaments flattened, also red; anthers as long, basifixed, tapering from the light yellow basal portion, otherwise purplish blue, dorsal spur straight and scarcely 1 mm. long, the ventral pair ascendingly curved and a trifle longer; style similarly red, terete, 7 mm. long, nearly straight, minutely striate, with a small capitate stigma; young fruit of a deep rich red.

Type specimen 11406, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in moist fertile soil of very dark humid wooded ravines along the Ceriban creek at 6750 of mount Apo or near Baclayan, the camping place of this mountain. The vernacular Bagobo name is "Tiwalos-tatana."

This is exactly 309 *De Vore* and *Hoover* from the same mountain, and in my opinion is different from the type of *M. apoensis C. B. Rob.*, based upon 2569 *Williams*. The leaves of our specimens are much smaller and are of a different shape. There are also floral differences.

Medinilla binaria Elm. n. sp.

Shrub, 2 m. high, numerously branched from near the base; branches rigid, erect or suberect, binary, compressed, deeply grooved along the edges, yellowish gray except the ultimate green portion, strict, glabrous, about 1 dm. long. Leaves flat, dull bottle green above, much paler or subglaucous beneath, caesius on the nether side when dry, the upper surface subumbrinus, glabrous or slightly scurfy along the sides of the veins, thick, rigid, easily breaking with a snap, entire, oval or elliptic with a short blunt point at apex, base broadly rounded and obscurely emarginate, 10 cm. long by 6 cm. wide across the middle or a trifle below it; veins 5, much more prominent on the upper side in the dry state, the basal pair arising 3 mm. from the base, the inner pair still further up, cross bars and reticulations obsolete beneath and conspicuous above when dry; petiole very short and extremely thick; axillary bristles persistent, yellowish gray, soft in texture, 1 cm. long, numerous; buds covered with latericius woolly hairs. Panicle pink, chiefly lateral but occasionally terminal, pendant, 1.5 dm. long, racemosely rebranched; peduncle 5 cm. long, angular, puberulent in the fluted edges, otherwise becoming glabrous, subtended by a brush of bristles; secondary branches in verticels, divaricately spreading, brown strigose, binary, 2 cm. long; their subtending bracts 7.5 mm. long, pulverulent, oblong, thin, their axils full of bearded bristles; calyx reddish, spotted with very small reddish brown scales or lenticels, the expanded rim very obscurely 4-apiculate, 5 mm. across the top, less in height, broadly cup shaped; petals 4, nearly 1 cm. long, trapeziform, pink; stamens all fertile, 8; filaments 3 mm. long, dilated especially toward the base, whitish; anthers a trifle longer, gradually pointed, basifixed, with a short but straight spur on the basal dorsal side, the ventral pair ascendingly curved, purplish toward the apex, at the base yellowish; style terete, slender, 1 cm. long, slightly curved and thinner at the stigmatic tip.

Type specimen 9736, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, April, 1908.

Among alpine moss laden shruberries on the rim of the shallow wet and wooded crater at 6000 feet altitude. The Visayan woodsman called it "Yagumum-magamai."

Its affinities are with *M. cordata Merr.* based upon my number 5805 from mount Santo Tomas, province of Benguet.

Medinilla bagobo Elm. n. sp.

Scandent shrub; stem 5 cm. thick, terete, crooked, numerously branched at the top; wood whitish, soft, odorless and tasteless; bark thick, yellowish brown, coarsely checked; branches freely rebranched, thickened at the joints, the slender twigs green and ascending, subterete, glabrous even the young tips. Leaves thinly coriaceous, also glabrous, opposite, acute at apex, cuneate at base, quite variable in size, oblong to obovately oblong, entire, curing dull brown beneath and nearly black on the upper side, the larger blades 12.5 cm. long by 5 cm. wide across the middle; midvein yellowish gray beneath, pronounced, glabrous, with 2 lateral pairs; the basal pair arising 5 mm. from the base and becoming obscure toward the end of the blade, the bolder or upper pair arising 1.5 cm. from the base and extending clear into the apex, cross bars none; petiole slender, 1.5 to 2.5 cm. long, glabrous, caniculate along the upper side. Inflorescence lateral, profuse; peduncles green, 1.5 to 3 cm. long, usually in whorls, glabrate, occasionally few and short branched at the distal end, more or less angled; pedicels curved, slender, 1 cm. long, striate, also glabrate, red; calyx campanulate, 7.5 mm. long, with a red nearly truncate rim; petals 4, pink or whitish when old, rotately spreading, obovately oblong, veiny, 1.25 cm. long, one half as wide above the middle; stamens 8, about 6 mm. long, glabrous, whitish, more or less dilated; anther very oblique or transverse, 2 mm. long including the spurs, thick, obliquely truncate at apex, the dorsal curved spur slender and 1 mm. long, the pair of opposite spurs very thick and blunt, subbasifixed, pink except the light yellow base; style 9 mm. long, terete, with a small capitate stigma.

Type specimen 11617, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

In humid forests of very moist fertile soil at 3750 feet altitude. The natives or Bagobos call it "Bagobo" as they do some other species of this family.

My number 10502 is typical of *Dr. Copeland's* specimen from Zamboanga and which is marked *M. copelandii Merr.* This proposed new species is a near ally.

Medinilla elegans Elm. n. sp.

A scandent shrub, climbing along small tree trunks; stem 3 cm. thick, terete, tightly attached to its support; branches scattered, crookedly rebranched, rather long and slender, somewhat drooping, the ultimate subterete ones densely covered with fuligineus hairs. Leaves coriaceous, horizontally spreading, very abruptly acute or acuminate, base broadly obtuse or merely rounded, the dry entire margins slightly involute, elliptic or ovately so, the blades about 12.5 cm. long, 7.5 cm. wide across the middle, frequently much smaller, opposite, the upper side glabrous and dark shining green, yellowish green beneath and in the young state sprinkled with fine rusty brown scales which soon disappear; midvein conspicuous beneath and somewhat brown scurfy; the basal lateral pair of veins arising 3 mm. from the base and extending along the margin to above the middle of the blade, the middle pair arising 5 to 7.5 cm. from the base and extending into the apex, the upper pair arising 2 cm. from the base and also extending into the apex, all more or less scurfy in the early state, cross bars none; petiole varying from 1 to 5 cm. long, scurfy at first, ultimately glabrate, finely grooved along the upper side. Inflorescence verticellately clustered along the branchlets; peduncles strict, reddish, slightly ascending, 3 cm. long, dark brown hairy, at the base subtended by similar bristles; branches verticellate, strict, subtended by brown scurfy 5 mm. long rather linear bracts, 7.5 mm. long; true pedicels thick, 3 mm. long, at the base articulate and subtended by a pair of similar bracts, brown puberulent; calyx cup shaped, whitish, hard, with a 1 cm. wide truncate calyx rim, hardly as high, glabrous; petals 6, arranged in a windmill fashion, whitish toward the narrowed and veiny base, 2 cm. long, 1 cm. wide, obliquely oblong or obovately so, apex pink and entire or bilobed; stamens 12; filaments whitish, glabrous, flattened toward the base, 7 mm. long; anthers as long, curved toward the pointed apex, slenderly tapering from base to apex, smooth, the descending dorsal spur 1 mm. long, the ventral pair of spur a trifle longer, very blunt and

ascendingly curved, basal portion light yellow, otherwise purplish blue; style white, terete, nearly straight, 1.5 cm. long, tapering toward the minute capitate stigma.

Type specimens 11311 and 10900, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August and June respectively, 1909.

Forming loosely tangled masses 20 feet above the moist humus covered ground in forested flats at 4000 feet altitude. "Tiwalos" is the Bagobo name for both numbers. An elegant species, with pink or rose red flowers occasionally measuring two inches across!

Medinilla versicolor Elm. n. sp.

Erect shrub; stem 7.5 cm. thick, 3 mm. high; wood rather soft, pinkish white; bark yellowish brown, checked; branches slender and lax, widely spreading, the young portion subterete and brown pulverulent. Leaves horizontal or descending, the abruptly acute apex recurved, entire margins crinkled and faintly involute, base cuneate to obtuse, glabrous, velvety dark green on the upper side, yellowish green beneath, subcoriaceous, flat, murinus gray on the upper side when dry, beneath brownish, the 2 opposing leaves quite a little unequal in size, elliptically oblongish, the larger blades 1 dm. long by one half as wide across the middle, scattered along the twigs, midvein prominent beneath, dirty brown scaly, finally glabrate, with 2 lateral pairs of veins; the finer basal pair from 3 mm. above the base and extending nearly to the apex, the other pair arising 2 cm. above the base and arched into the apical point, cross bars relatively faint yet quite evident from the nether side; petiole 1.25 cm. long, brownish, ultimately glabrous, caniculate along the upper side. Panicle sparingly branched from below the middle, 5 cm. long, terminal or from the uppermost leaf axils, ascending; peduncles green except the brown puberulence; branches shorter, otherwise similar, more or less angled; pedicels terete, 5 mm. long, slightly brown scurfy; calyx suburceolate, 5 mm. long, yellowish or with a pink truncate or simply apiculate apex; petals 5, narrowed toward the base, 7.5 mm. long, obliquely obovate, 5 mm. wide above the middle, creamy white; stamens 10; filaments slender, 4 mm. long, smooth and glabrous; anther basifixed,

2 mm. long, tapering from base to apex, the yellowish base with a descending dorsal spur and a pair of thick and blunt ventral pair, the dorsal apical portion pink; style terete, constricted at the base, 7 mm. long, tapering toward the minute stigma, both it and the filaments whitish and tinged with red; fruits claret red.

Type specimen 11824, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

On a well drained wooded ridge at 4500 feet altitude above Mainit creek and on the trail to Baclayan. "Iwalos" is the Bagobo name.

The flowers possess a variety of colors and the dark red fruits coupled with the pleasingly green colored leaves is very pretty. Allied to *M. astronioides Tri.*

Medinilla umbrina Elm. n. sp.

A shrub; stem 5 m. high, at least 1 dm. thick, crooked and branched from below the middle; wood soft, reddish white in the center, without odor or taste; bark light yellowish gray, roughened with lenticels or excrescences on the terete branchlets which are minutely ridged, the young tips densely covered with umber brown scales, laxly rebranched, the ultimate ones suberect. Leaves horizontally spreading, curing unequally dull brown on both sides, coriaceous, recurved toward the short acute to acuminate point, velvety, dark green above, much paler beneath, umber scurfy on both sides when young but finally glabrous on the upper side only, diverse in size, the average laminae 1.5 dm. long, 7.5 cm. wide across the middle or a trifle below it, the entire margins flat, elliptically oblong or ovately so, base roundly obtuse or seldom acute, occasionally inequilateral, young leaves latericius brown; midvein conspicuous beneath, umber scurfy; the upper pair of lateral veins arising 2 cm. from the base and curving into the very point of the apex, the middle pair 5 mm. from the base and confluent with the inner pair at the apex, the basal pair 1 or 2 mm. from the base and curving along the margin well up toward the apex, cross bars numerous and conspicuous, all brown scurfy; petiole averaging 2 cm. long, similarly scurfy although when old glabrate. Inflorescence or infrutescence chiefly pendant from the branches, 5 to 8 cm. long, divaricately branched from the middle, only sparingly rebranched, main branches

shorter than the peduncle, in subwhorls, all stalks striate, green and covered with fine umber scales; pedicels 3 mm. long, thick, densely scurfy, usually 1 to 3-clustered from the distal ends of the branchlets; calyx cupular, 5 mm. high, truncate, green and covered with a fine rusty brown pulverulence; petals 5, white or tinged with red, rotately twisted, 1 cm. long, veiny at the narrowed base, otherwise obliquely oblong, one half as wide at the middle; stamens 10; filaments subterete, 4 mm. long, whitish, glabrous; anthers basifixed, 3 mm. long, linear, the connective extended at the base into a 1 mm. long dorsal spur, the blunt ventral pair ascendingly curved, the upper portion blue, otherwise yellow; style 9 mm. long, terete, strict, smooth and glabrous, bearing a small stigma; young fruits hard, green, globose, 1 cm. in diameter.

Type specimen 11496, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in very moist sand gravelly soil of a densely wooded ravine along the Cati creek of mount Apo at 6000 feet. The natives or Bagobos know it as "Calayan."

Like the preceding it is allied to *M. astronioides Tri.*

Medinilla brevipedunculata Elm. n. sp.

A laxly creeping or subscandent shrub; stem twining, sparingly branched, terete, root-like, the young portion covered with badius colored bristles and 5 mm. thick, taking root at the joints. Leaves opposite, only a few scattered pairs, equal, subcoriaceous, paler beneath, glabrous, ardesicus when dry, oblong, gradually tapering toward the abruptly acuminate and recurved apex, base usually equilateral and acute to short obtuse, entire, blades 2 dm. long by 7.5 cm. wide across the middle, frequently larger and occasionally smaller; midvein very bold and in the early state setose; lateral pairs of nerves 3, all glabrate, the upper pair arising from near the middle and uniting with the middle one at the base of the apical point, the middle pair submarginally extending clear into the apex, the basal pair arising 1 cm. from the base and running along the margin to above the middle of the lamina, cross bars distinct; petiole very stout, ultimately glabrous, 3 to 4 cm. long; hairs in the leaf axils especially dense and numerous. Infrutescence mostly lateral, pendulous; pe-

duncle subtended by brown bristles, 3 to 8 cm. long, terete, glabrous, strict; fruits umbellately clustered at the end of the peduncle, subglobose, dark red to purplish blue, 7.5 mm. across, with a cupular rim; pedicels glabrous, 1.25 cm. long, strict, subtended by glabrous linearly oblong bracts; seeds indefinite, smooth, clavate, 1 mm. long, straw brown except the blackish lateral side.

Type specimen 7584, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

Discovered in deep woods near cliffs at 3000 feet of mount Banahao. Rare!

Distinguished from *M. annulata C. B. Rob.* by the short strict peduncle and other characters of the leaves.

Medinilla pumilis Elm. n. sp.

A low and laxly sparingly branched shrub; stem terete, 1 cm. thick, 4 to 6 dm. long, covered with brown lenticelled yellowish gray bark. Leaves ascending, flat, thinly coriaceous, deep green above, light green beneath, griseus gray when dry, entire, glabrous, opposite, oblongish, the larger blades 2 dm. long by 6 cm. wide across the middle, apex abruptly constricted into a very narrow and sharply acuminate point, base occasionally a trifle inequilateral and broadly obtuse; midvein deep brown beneath, conspicuous, also glabrous; lateral pairs of veins 3, the faint basal pair arising 3 mm. from the base and submarginal to the middle of the blade, the middle pair arising 1.5 cm. from the base and uniting with the midvein in the apex, the upper or boldest pair arising 5 cm. from the base and confluent with the other veins at the base of the sharply pointed apex, cross bars very faint; petiole glabrous, caniculate along the upper side, the larger 2 cm. long. Inflorescence or infrutescence along the stem and few branched; peduncle 5 cm. long, usually curved or subpendant, glabrous, reddish, flower bearing at the apex or short branched; pedicels 5 mm. long or longer, umbellately clustered at the distal ends, usually subtended by deciduous bracteoles; calyx campanulate, 6 mm. long, 5 mm. wide, the rim slightly expanded; petals probably 5, thin, pale red, deciduous, irregularly oblique, 1.25 cm. long, nearly one half as wide, oblongish, obscurely lobed on the side below the middle; stamens probably 10; the 5 fertile ones

with 5 mm. long whitish filaments; anther bases light yellow, the dorsal apical portion washblue, slenderly tapering, 1 to 2 mm. longer than the filaments, the dorsal spur descending and 1 mm. long, the ventral pair very thick and ascendingly curved; style terete, bearing a minute capitate stigma, as long as the stamens; young fruits 1 cm. across, narrowed about the rim, red.

Type specimen 10533, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

This *Medinilla* inhabits wet fertile soil thickly covered with humus in dense woods or forest at 4250 feet, south of the Sibulan river and along the trail to Baclayan. "Diwalos" is the Bagobo name.

Probably related to *M. annulata C. B. Rob.* and to my preceding species.

Medinilla gitingensis Elm. n. sp.

Shrubby; stem solitary or few from the same root cluster, 7.5 cm. thick, 4 m. long, branched from below the middle; wood quite hard, brittle, reddish tinged especially the heartwood, odorless, tasteless or a trifle bitter; bark thick, dull gray and checked; branches numerous, lax, with ascending tips, the green young portion subterete and glabrous. Leaves in whorls of 3, triplinerved, ascending or horizontal, nearly flat, gracefully recurved, leathery, deep green above, much paler beneath, when dry ardesiacus above and avellaneus on the nether side, entire edges slightly recurved, lanceolate or lanceolately fusiform, gradually tapering toward the acuminate apex, base cuneate and occasionally inequilateral, blades 1.5 dm. long by 2.5 cm. wide across the middle, glabrous; midvein reddish beneath toward the base, the only lateral pair of veins arising 1 cm. from the base and faintly extending into the apex, cross bars none; petiole red and glabrous, 2 cm. long. Panicle terminal, ascending, 1 to 2 dm. long, glabrous and rose red; branches slender, verticellately spreading, rebranched from above the middle, all branches subtended by setaceous-like bracts; pedicels 5 to 10 mm. long, very slender, glabrous; calyx reddish, 5 mm. long, urceolate, with a truncate rim, more or less tuberculate in the dry state; petals 4, rose red or whitish, 15 mm. long by one half as wide across the middle, obliquely oblong, veiny; stamens 8; filaments 8 mm. long,

glabrous, somewhat dilated, similarly colored; anthers smooth and glabrous, fully as long, curved toward the apex, gradually tapering from base to apex, the dorsal spur short and blunt, the ventral pair thick and united, the basal portion light yellow, balance wash blue or bluish purple; style also glabrous, subterete, 2 cm. long, only slightly curved, deep red, bearing a minute capitate stigma.

Type specimen 12417, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Sibuyan, May, 1910.

Discovered upon seepage cliffs along the Pauala river at 1500 feet altitude. The local Visayan call it "Maverde-na-cahoy."

The leaves of this are triplinerved as in the next species, yet they average shorter and are blunter. The buds are sharply pointed, calyx urceolate, with larger floral organs whose anthers are entirely smooth.

Medinilla merrillii Elm. n. sp.

Epiphytic shrub; stems few or several, 2 m. long, 3 cm. thick; wood reddish toward the center, rather soft, without odor or taste; bark grayish brown, thinly checked; branchlets lax, with ascendingly curved glabrous and subterete tips. Leaves upon ascending petioles, rotately spreading, thickly coriaceous, dull deep green above, much lighter beneath, greenish brown on both sides when dry, entire, severally verticellate, leaving large scars about the thickened joints, frequently appearing a trifle inequilateral, gradually acute, base obtuse or cuneate, the larger blades nearly 1 dm. long, fully 2.5 cm. wide across the middle, triplinerved, cross bars none; petiole nearly 2 cm. long, glabrous, shallowly grooved or flattened on the upper side. Inflorescence from the branches, pendulous; peduncle 2 dm. long or less, red, glabrous, verticellately branched toward the distal end only; branches 1 to 2 cm. long, strict; flowers few and umbellately clustered at the distal end of the branches or short branchlets; pedicels terete, 7.5 mm. long, gradually thickened toward the top; light pink; calyx 4 mm. long, 3 mm. across, with a spreading truncate rim 1 mm. deep, similar in color, more or less cup shaped; petals pink, 4, oblongish, nearly 1 cm. long, 6 mm. wide across the middle, one side above the middle strongly oblique, veiny, thin; stamens 8, inserted upon the inner portion of the calyx

rim and free from the petals, similarly colored, compressed or dilated, glabrous, 5 mm. long; anthers 7 mm. long, light yellow especially toward the base, thin, horns bluish purple, slenderly tapering from base to the rather sharply pointed tips, dorsal spur very short, the ventral pair curved, 1 mm. long, blunt and united below the middle, pulverulent or finely papillose along the basal dorsal side of the strongly curved anther, otherwise smooth and glabrous; style 8 mm. long, terete, glabrous, red, doubly curved, terminated by a minute capitate and finely granular stigma.

Type specimen 11249, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Collected from tree trunks 15 feet from the ground in a forested ridge of well drained soil at 3250 feet of mount Burebid. Named after *Mr. E. D. Merrill*, who has done considerable work on our Philippine *Melastomataceae*. "Cayaupang" is the Bagobo name.

Number 11487 from Apo is typical *M. elmeri Merr.* which is very close to *M. pendula Merr.* Both are based upon my numbers 5848 and 6037, collected in March 1904 at Baguio. Our present new species has only triplinerved leaves, the leaf axils are without the bearded bristles and has entirely different flowers.

Medinilla subdolichophylla Elm. n. sp.

A shrub, 2 to 3 m. high, numerously and crookedly branched, forming spreading bushes; ultimate branchlets slender, gray or yellowish so, compressed, conspicuouly winged along the edges, the young portion green and glabrous. Leaves coriaceous, opposite, widely scattering, glabrous, drying grayish green, conduplicate on the upper darker yet more shining green surface, entire, the slenderly acuminate apex recurved, the larger blades measure 3 dm. long by 6 cm. wide below the middle, narrowly oblong to broadly lanceolate, base obtuse or rounded, cross bars more evident on the upper side in the dry state at least; midvein conspicuous on both sides, brown and glabrous, the primary pairs of lateral veins arising 5 cm. above the base and are confluent with the midvein at about the base of the apical point, the secondary pair arising 1 cm. from the base and gradually becoming obsolete

at about the middle of the blade; petiole 1.5 cm. long, very thick and compressed, obscurely winged, striate along the lower side; axillary brush caespitose, 5 mm. long, brown and glabrous. Infrutescent spike terminal, pendulous, 2.5 dm. long, slender, glabrous, reddish to blue, subtended at or toward the base by brown linear lanceolate 1 cm. long bracts; branches short, subverticellate, all glabrous and of the same color, subcompressed, subtended by bracteoles; fruits in small umbellate clusters at the distal end of the secondary branchlets; pedicels 1 cm. long, strict, also glabrous; immature fruits ovoidly globose, with a truncate rim 7.5 mm. across, reddish blue.

Type specimen 8635, *A. D. E. Elmer*, Baguio (Mt. Santo Tomas), Province of Benguet, Luzon, March, 1907.

Sprawling over large bowlders of stream beds or upon limestone outcropping of the pine region at 5000 feet.

Closely related to *M. dolichophylla Merr.* but leaves larger and more numerously nerved. More distantly related to *M. clementis* of the same author.

Medinilla cuernosensis Elm. n. sp.

Scandent; branches terete, grayish white, with brown lenticels, the terminal ones densely covered with fine setae-like hairs, testaceus in color. Leaves flat, horizontally spreading or descending, only the young ones erect, much lighter green beneath, opposite, the pair very unequal in size, greenish brown when dry, margins entire, submembranous, gradually tapering into the acuminate apex, base rounded or obtuse, the largest blades 1 dm. long by 4 cm. long and ovate or ovately oblong in shape, soft, setosely hairy on both sides; veins more evident from below, brown, densely avellaneus bristly, usually only 3 pairs but the larger leaves with an extra basal pair; the upper pair arising 3 cm. from the base and extending into the apex, the middle pair arising 1.5 cm. from the base and extending nearly to the apex, the lower pair arising 1 cm. from the base and extending to above the middle of the lamina, the basal or obscure pair arising 2 to 3 mm. above the base and extending to above the middle of the lamina, all subparallel, the small blades with only 2 or 3 lateral pairs of veins; petiole of the larger blades 1 cm. long, densely hairy, that of the smaller blades only one third as long. Inflor-

escence usually from the axils of the smaller leaves, ascending, 1 to 3 cm. long, few paniculately branched from below the middle or only pedicelled; peduncle slender, testaceus hairy, pedicels divaricate, 5 mm. long, subtended by ovate or oblongish lanceolate setose bracts which in age become reddish; petals 5, delicate, whitish, truncately oblong, veiny, deciduous; calyx rim dilated, 5, apiculate; stamens 10, equal, easily falling; filaments 4 mm. long, glabrous, somewhat dilated; anthers equalling the filaments, basifixed, pinkish toward the acuminate tips, the basal portion light yellow, the dorsal spur very blunt, the pair of ventral spurs much longer and ascendingly curved; style terete, reddish, glabrous, usually curved, terminated by a small capitate stigma; the upper portion of the ovary free and sparsely hairy; berry globose, deep green, covered with bristly whitish hairs.

Type specimen 10227, *A. D. E. Elmer*, Dumaguete (Cuernos Mts.), Province of Negros Oriental, Negros, June, 1908.

Lax bushes upon tree trunks 10 feet from the ground in humid woods at 4250 feet altitude.

This as well as the next species are allies of *M. involucrata Merr.*

Medinilla erythrotricha Elm. n. sp.

Lax and suberect undershrub; stem 1 to 1.5 m. high, green, becoming yellowish gray, terete, 1.25 cm. thick, the few branchlets bristly covered with reddish or latericius hairs. Leaves subcoriaceous, horizontally spreading, the abrupt and very sharply pointed tips recurved, dark green above, much paler beneath, the lower leaves usually in pairs, the uppermost in whorls of 3, quite unequal in size, drying unequally brown on the upper and lower side, entire, both sides covered with reddish hairs, the larger blades 1.5 dm. long, 6.5 cm. wide across the middle, base obtusely rounded or occasionally subauriculate, elliptic to elliptic oblong, the smaller blades 6 cm. long by 3.5 cm. wide; midvein densely setose beneath, the 3 lateral pairs similar; the upper pair of lateral veins arising 3.5 cm. from the base and extending into the apical point, the middle pair 1.5 cm. from the base and curving nearly to the apex, the basal pair arising 5 mm. from the base of the blade and extending to about the middle; petiole very short and thick, testaceus, bristly. Inflorescence terminal,

axillary or lateral, pendulous, 3 to 8 cm. long; spike flower bearing from below the middle, covered with numerous reddish bristles which with age become yellowish gray; flowers arranged in 1 to 3 whorls, subtended by ovate to broadly lanceolate bracts which are similarly hairy on the outside; pedicels at least 5 mm. long, very setose; petals pink, deciduous, 1.25 cm. long, oblong, with the widest portion toward the truncate apex, veiny; calyx bristly setose, the apiculate rim somewhat dilated, glabrous on the upper side; filaments whitish, glabrous, flattened especially toward the base, 4.5 cm. long; anther as long, nearly straight, gradually tapering from base to apex, basifixed, with a short blunt dorsal spur and a pair of larger and somewhat curved ventral spurs, the basal portion yellow, tips red; ovary woolly; style 10 mm. long, glabrous, subterete, red; stigma flattened, terminal; fruits dark green.

Type specimen 10537, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1911.

This low shrub was discovered in moist fertile soil of a densely forested basin at 4250 feet along the trail from Todaya to Baclayan. The Bagobos know it as "Tiwalas-ta-tana."

Medinilla attenuata Elm. n. sp.

A low and lax shrub; stem the size of a small pencil, terete, 1 m. high, branched, the ultimate ones isabellinus hairy. Leaves horizontally spreading, flat, subcoriaceous, only the sharply acuminate tips recurved, dull deep green above, much lighter so beneath, dirty brown when dry, the entire margins crinkled in the dry state, base broadly alternate or subpandurate, beneath crisply hairy especially along the veins, the upper surface glabrate, opposite or in 3's, quite unequal in size, the largest blades 1.5 dm. long, 4 cm. wide above the middle, obovately oblong or broadly oblanceolate for the smaller ones which only measure 6 cm. long by 2 cm. wide, veins of 3 lateral pairs besides the midvein, the upper pair of lateral veins arising 5 cm. above the base of the blade and extending into the apex, the middle pair 2.5 cm. from the base and arching toward the apex, the basal pair 1 cm. from the base and submarginally running to above the middle of the blade; petiole thick, only a few mm. long, densely bearded. Inflorescence along the branches, divaricate or pendant, racemose

or cymosely spreading from below the middle, 3 to 5 cm. long, the rachis densely reddish hairy; flowers in 2 to 3 whorls; pedicels very slender, 7.5 mm. long, subtended by rather broad veiny bracts yellowish white hairy on the back; the pair of subtending bracts of the berries are only sparsely hairy on the back; young fruit dark green, the truncate glabrous apex reddish, otherwise covered with dense dull silky white hairs.

Type specimen 11740, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered in rich moist soil of dense forests at 3500 feet altitude, on the south side of the Baruring river. "Tiwalos" is the native Bagobo name.

This species with the two preceding and several other Philippine species form a very natural group. Ours seems to be most closely related to *M. involucrata Merr.*

Medinilla confluentinervia Elm. n. sp.

Epiphytic shrub; stem 3 to 4 m. long, ascending or horizontal, crookedly rebranched, terete; wood moderately hard, whitish or reddish tinged in the center, without odor or taste; bark yellowish brown, checked; twigs suberect, purplish, angular but not winged. Leaves coriaceous, glabrous, opposite, dull deep green above, much lighter green or even yellowish so beneath, the entire margins crinkled and minutely revolute in the dry state, elliptic to elliptically oblong, rigidly coriaceous, the average ones 2 dm. long by 1 dm. wide at the middle, apex rather broad, conical or broadly obtuse and terminated into an abrupt and sharply acute to acuminate point, base broadly obtuse and subauriculate; midvein prominently raised beneath, with 3 pairs of lateral veins, the large blades with a short basal additional pair; upper pair arising 4 cm. from the base and confluent with the midvein 4 cm. from the apex, the middle pair arising 1.5 cm. from the base and confluent with the midvein 1 cm. from the apex or just at the base of the slender tip, the lower pair arising 5 mm. above the base and running parallel with the margin to above the middle of the lamina; petiole very stout, 5 mm. long, also glabrous; beard grayish, 7.5 mm. long, not dense, becoming nearly glabrate. Inflorescence suberect, terminal, paniculate; peduncle terete, deep red and streaked with green,

1 to 2 dm. long, occasionally single but usually 3; the flowering portion at least as long as the peduncle, its rachis angular; branches verticellate, lighter red, compressed, brown pulverulent, finally glabrate, the larger ones few and short branched at the end, subtended by oblong 1 cm. long puberulent red bracts; pedicels 1 cm. long, terete, pink, only slightly thickened toward the distal end, usually subtended toward the base with a single or pair of bracteoles; calyx pinkish white, short campanulate, 4 mm. long, rim truncate; petals rose red, 5, oblongish, 1.25 cm. long; stamens 10, one half of them a trifle shorter; the filaments whitish especially toward the base, 4.5 mm. long, dilated; anthers nearly as long, gradually tapering from the base toward the purplish blue tip, basifixed, at the yellow base with a single dorsal spur and a pair of ventral rather blunt spurs; style also whitish, 1 cm. long, terete, bearing a minute stigma; young fruit 5 mm. in diameter, bearing a constricted cupular rim.

Type specimen 11469, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Inhabits humid forests of flat somewhat swampy soil at 6000 feet of mount Apo. The Bagobos call it "Calambuglambug."

The confluent nerves distinguish it from all other Philippine species.

Medinilla banahaensis Elm. n. sp.

Subepiphytic shrubs; stems usually few to several, ascending or drooping, 1 to 2 m. long, crookedly rebranched, terete; wood pale white, odorless, moderately hard, bark gray or brown, finely checked; twigs suberect, strongly 4-angled and 4-winged. Leaves ascendingly curved at the base, coriaceous, dull green above, much lighter beneath, opposite, flat, glabrous, 3 dm. long by 13 cm. wide at the middle, the entire margins crinkled and a trifle involute in the dry state, terminated by a short abrupt acute point, elliptically elongated, curing brownish on both sides, base roundly obtuse; midvein glabrous, prominently raised beneath; lateral veins 3 on each side, the basal or smallest pair arising 5 mm. from the base and extending along the margin to above the middle of the blade, the middle pair arising 1.5 cm. from the base and usually uniting with the midvein in the apex, the upper or bolder pair

arising 5 cm. from the base and confluent with the midvein a trifle below the apical point; cross bars faint and oblique, more conspicuous from the upper side in the dry state; petioles very thick, 1 cm. long, nearly as wide, much flattened; axillary beard cremeus, subpersistent, soft, 1 to 3 cm. long, dense. Inflorescence succulent; peduncle from the leaf axils or lateral, descendingly curved, 1 to 2 dm. long in the flowering state, glabrous and flesh red, the flowering portion about as long as the peduncle, racemosely paniculate, pendant, all the bracts, stalks and calyces pink; branchlets in verticels, 2 to 4 cm. long, subtended by broadly oblong bracts 1 to 1.5 cm. in length, flower bearing or occasionally branched at the distal end; flowers umbellately clustered usually from short secondary branchlets, subtended by smaller glabrous bracts; pedicels 5 to 8 mm. long; calyx 5 mm. long, subcampanulate, rim perfectly truncate; petals 5, obovately oblong, 7.5 mm. long, 5 mm. wide above the middle, apex rounded, also whitish or red when young; stamens 10; filaments of the same color, 5 mm. long, compressed; anthers linear lanceolate, 3 mm. long, the connective extended into a short and descending dorsal spur at the base, the pair of ventral lobes or spurs very broad, basifixed at the yellowish base, otherwise purplish blue; style terete, 8 mm. long, glabrous, slightly curved, faintly striate, stigma small and capitate; globose fruits blue or purple.

Type specimens 11466[a] and 7761, *A. D. E. Elmer*, the former from Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909; the latter from Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

Reclining upon horizontal large limbs, trunks and even upon raised roots of the densely moss and scale moss laden elfinwoods in cold wet depressions at 6000 feet of both of mounts Apo and Banahao.

Only the foliage reminds one of *M. amplifolia Merr.* which may be the same as *M. magnifolia Lindl.* It is more distantly related to *M. cumingii Naud.*

Medinilla cordatifolia Elm. n. sp.

Epiphytic shrub; stem and main branches 2.5 cm. thick, terete, sparingly rebranched; the crooked twigs slender and descending, flattened, green except the dry wings, their tips ascend-

ingly curved; wood soft, with a large green pith, odorless and tasteless; bark brown, coarsely lenticelled. Leaves descending, subchartaceous, flat, much paler green beneath, curing dull greenish gray, mostly opposite, the entire margins minutely involute, glabrous, the larger blades 2 dm. long, 9 cm. wide below the middle, ovately oblong or the smaller ones oblongish, gradually coming to the sharply acute apex, base cordate; veins glabrous, prominently raised, with 3 or 4 lateral pairs, the basal or fourth pair arising from the base and extending toward the middle of the blade, the next upper pair arising from the same place and extending to above the middle, the next arising 5 mm. above the base and extending nearly to the apex, the upper pair arising 2 cm. from the base and confluent with the midvein in the apical point; petiole 1.5 to 3 cm. long, very thick, glabrous, striate along the upper side; beard profuse, 1.5 cm. long, shining brown. Inflorescence terminal; peduncle striate, glabrous, subpendulous, 1 to 2 dm. long, reddish; racemose inflorescence shorter than the peduncle; branches verticellate, red, spreading, the larger 2 cm. long, occasionally short branched at the distal end, subtended by bracts and with crisp brown hairs in the axils; pedicels terete, pink, few clustered at the ends, 1 cm. long, a trifle thicker toward the distal end; calyx suburceolate, 5 mm. long, with a 2 mm. wide truncate rim; petals pale pink, 1 cm. long, 5, oblongish and with obliquely truncate apices; stamens 10, all equal and fertile, inflexed in the bud state; filaments whitish, narrowed at the apex, compressed and adnate toward the base upon the corolla, 4.5 mm. long, anthers basifixed, equal in length, lanceolately linear, on the dorsal side of the yellow base with a very short and strict spur, the ventral pair of curved spurs very thick and in the young state more or less united, dark blue toward the apex; style straight, exceeding the stamens, whitish toward the base, reddish toward the small capitate stigma; fruiting stalks all red, berries dull blue, 7.5 mm. in diameter, globose except the narrowed calyx rim.

Type specimen 10890[a], *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

This species was discovered about tree trunks 15 feet from the humid soil in a deep forested flat at 4000 feet, south of the Baruring river. The Bagobo gave me the name "Manago."

Approaching *M. clementis Merr.* but leaves broader, more nerved and distinctly cordate at base.

Medinilla robinsonii Elm. n. sp.

Scandent shrub; branches crookedly rebranched, 1.5 cm. thick, the ultimate ones comparatively short, more or less gnarly, young portions thin, subterete and brown pulverulent. Leaves coriaceous, curing unequally dull brown on the 2 sides, opposite, mostly toward the ends of the twigs, flat or only the acute apex recurved, base obtuse to subcuneate, the entire margins subinvolute in the dry state, much paler or lighter green beneath, the larger laminae 7.5 cm. long, 3.5 cm. wide across the middle or above the middle, elliptically oblong in number 9826 and obovately oblong in number 11254^{a}; midvein dark brown, conspicuous beneath, with 2 lateral pairs, the basal pair arising 2 mm. from the base and extending nearly to the apex, the upper lateral pair arising 5 mm. from the base and uniting at the apex with the midvein, cross bars obsolete; petiole at least 5 mm. long, brown puberulent. Inflorescence or infrutescence occasionally terminal but usually lateral upon slender 1 to 3 cm. long scurfy brown peduncles, few to severally flowered at the distal end, occasionally short branched; branchlets or pedicels subtended by a subpersistent whorl of bracts which are oblong in shape and vary from 5 to 8 mm. in length; pedicels for flowers short and subtended by a pair of similar bracts, very finely brown puberulent. ultimately glabrate; calyx in flower 8 mm. long by 6 mm. thick, cup shaped, smooth, hard; petals pinkish, 5, abruptly narrowed at the base, otherwise obliquely oblong, rather thick and somewhat rugose on the upper side, 1.5 cm. long, nearly 1 cm. wide across the middle; stamens 10, one half of which are sterile; filaments of the fertile ones subterete, 5 mm. long, narrowed at the apex, smooth or sprinkled with minute reddish brown lenticels; anthers as long, sharply pointed and gradually tapering from base to apex, the connective at the base produced into a short descending dorsal spur, the ventral pair of lobes or spurs very blunt and rather broad, occasionally sprinkled with reddish brown lenticels; style terete, 1 cm. long, strict, dotted with reddish lenticels; stigma small and terminal.

Type specimen 9826, *A. D. E. Elmer*, Dumaguete (Cuernos

Mts.), Province of Negros Oriental, Negros, April, 1908; also my number 11254[a] from the vicinity of mount Apo.

This small tree trunk climber was discovered on a moist wooded ridge at 4250 feet altitude. The Apo plant was collected in similar ecological conditions and was called by the Bagobos "Cayaupang." Named after *Dr. C. B. Robinson* who has described a number of new Philippine *Melastomataceae*.

M. malindangensis Merr. but fruits larger, pedicels shorter and involucral bracts much larger. The mount Apo specimens are very near our new species, yet they seem to approach *M. pachygona C. B. Rob.* We have in our archipelago quite a group of these very closely allied species which belong to the first section of *Medinilla* based upon *M. rosea Gaud.* from Guam.

Medinilla burebidensis Elm. n. sp.

Shrubby and scandent; stem terete, 2.5 cm. thick, flexible, numerously branched at the top; wood whitish, soft, without odor and taste; bark thick, grayish, smooth and lenticelled, minutely checked on the stem; young twigs green, striate, pulverulent, finely glabrous. Leaves scattered in whorls, coriaceous, ascending, the short obtuse apex recurved, dull green above and very much lighter so beneath, when dry griseus beneath and nearly black on the upper side, entire, glabrous, persistent, copious, elliptically oblong, the blades 4 cm. long by one half as wide across the middle, frequently smaller and broadly oblanceolate, base cuneate to obtuse and occasionally slightly inequilateral, triplinerved, submarginal line present in the larger leaves, without cross bars, petioles glabrate and 5 mm. long. Infrutescence ascending from the leaf axils; peduncles slender, strict, less than 1 cm. in length, finally glabrous, few umbellately branched at the distal end; secondary peduncle 7.5 mm. long, strict, very slender; pedicels thicker, purplish, terete, 4 mm. long, subtended by 2 subpersistent linear bracteoles; fruits short ovoid, very deep purple, 7.5 mm. across, apex deeply cup shaped.

Type specimen 11839, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

A small tree climber and forming tangled masses on a dry wooded ridge at 4500 feet of mount Burebid. This has leaves twice as large and of a different shape than those of the follow-

ing species from the same mountain range. The Bagobo vernacular name is "Capaleli."

Medinilla permicrophylla Elm. n. sp.

Scandent upon small trees; stem 3 cm. thick, branched especially toward the top, tightly cleaving to its support; wood soft, covered with rough grayish white bark; twigs numerous, forming dense bushes, suberect, faintly grooved along the sides, the young portion finely brown scurfy, ultimately glabrate. Leaves coriaceous, very copious, rotately spreading in a whorl of 4, flat, lucid dark green above, much paler green beneath, glabrous when old, sparsely pulverulent in the very young state, curing ater brown on the upper side and dull green beneath, margins thin and entire, obovate to obovately oblong to oblanceolate, the normal laminae 2.5 cm. long, 1 cm. wide above the middle, apex bluntly obtuse, base cuneate; midvein dull brown, with a pair of lateral ones arising from the base and curving into the round apex, cross bars and reticulations obsolete; petiole 3 to 5 mm. long, very slender, when young slightly scurfy brown. Infrutescence divaricate, suberect, lateral or axillary; peduncles green, one or more from the same axil, scurfy brown but ultimately glabrate, very slender, 1 cm. long, usually bearing a solitary fruit; pedicels thicker especially toward the distal end, reddish, subtended by a pair of dark brown 2 mm. long rather linear bracts; fruits 5 to 8 mm. across, glabrous, subglobose, with a truncate pink calyx rim; petals pure white; filaments also white; anther tips bluish white, yellow at their bases.

Type specimen 11226, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Twining about a small tree trunk of a moist forested ridge at 3750 feet of mount Burebid. The Bagobos call it "Cayaupang."

LEAFLETS OF PHILIPPINE BOTANY

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A FASCICLE OF DAVAO FIGS

By

A. D. E. Elmer

In this fascicle forty four species of *Ficus* are enumerated, fourteen of which are in the following pages proposed as new. There are two species belonging to the section *Synoecia*, two species of *Neomorphe*, four of *Eusyce*, six of *Palaeomorphe*, seven *Covellia*, eleven *Sycidium* and twelve species of *Urostigma*. Most of this material was collected in the woods and forests having an altitudinal range from 1500 to 4000 feet. Only two species, *F. altissima Blm.* from near Digos and *F. palawanensis Merr.* from near Daron were collected in the coastal plain. Comparatively few were taken at 1500 feet elevation or along the upper limits of the cogon regions, while by far the most of them were gathered between 2500 feet and 3500 feet altitude. This only partly indicates the limits of my exploration, and no doubt there are other species remaining in the plains about the plantations and in the wooded depressions along the water courses leading through the cogon formation up to 1500 feet altitude. Neither on mount Apo nor on mount Calelan have I noticed any species above 5000 feet. In middle northern Luzon they inhabit higher elevations. I failed to collect along the coast such common species as *F. heterocarpa Miq.*, *F. ampelas Burm.*, *F. pseudopalma Blco.*, *F. tinctoria Wall.* and *F. mindanaensis Warb.* Again, *Dr. Otto Warburg* as well as *Mr. R. S. Williams* collected in this same general region some species which I did not secure. If, therefore, a careful search for figs would be made near the coastal

entrance to Apo, the number could easily be augmented to sixty or more species.

All species of *Ficus* require a good deal of moisture rather than good soil, yet in somewhat sheltered places where these two conditions are combined we find monstrous trees developed. The finest and largest tree species I ever saw inhabits the vast mount Apo forested basin at 4000 feet. This particular species is *F. apoensis Elm.* and has a trunk perfectly round and straight, five feet through and seventy five feet to its first limbs!

In all localities at middle elevations, the bulk of our species are found along water courses, a number of them inhabiting the rock crevices of cliffs. Especially do they seem to like deep, cool and well shaded gorges or deep and narrow cuts, and usually one finds extended over small cascades large widely spreading epiphytic cleavers of some *Ficus* or another.

The Bagobos are a unique tribe, not a great many of them and all settled upon the southern and southeastern extensions of mount Apo. They are the most characteristic in dress and the most truly hospitable I have ever lived and worked among in the Philippines. Certainly they are trained botanists, and have a name for every plant in that wonderful flora of mount Apo and its vicinity. Occasionally my field labels are without their vernacular names, but that is because I failed to ask for them. It is most interesting how they came to recognize the natural affinities of groups of plants, and to know that they actually possess a primitive system of classification based upon natural law and its result. These natives, especially those who live well up in the mountains, have characteristic names for closely allied groups of ferns, they know their eighteen species of oaks by practically one name only, most of the species of *Canarium* go under one name. But when it comes to the bamboos and the twenty five rattan species in their country, they are most careful in their specific names, for these are important economic plants and must be understood. I have on several occasions deliberately tried to confuse my old companion *Angat* by having other men at the camp verify his statements made to me in the field, and when material was on hand for comparison it has led to desperate discussions among themselves. My camp boss was from the lower country and he would always try to reconcile the lower flora with what we gathered in from the higher regions.

In nearly all cases I could safely decide with *Angat* as knowing the alpine flora best. Here I am tempted to intersperse something else than subject matter. During my first few weeks of exploration work in company with the old man, I flattered myself in having obtained such a trained and useful native. Some few years before he was the chief companion of *Dr. Copeland* and *Maj. Mearns*, and out in the field he would diligently look up into the trees, and as I thought he was searching for flowering or fruiting plants among the trees. But I soon found out that he was hunting for honey-bee trees!

In the naming of our figs I find the Bagobos applied numerous different names, but occasionally two or three related species they would give the same name. Besides these minor incidents they called the following species "Cataupi"; *F. villosa Blm., F. areolata Elm.* and *F. cataupi Elm.* The following are known to them as "Magulipi"; *F. caudatifolia Warb., F. celebica Blm., F. flavo-cortica Elm., F. inaequifolia Elm., F. confusa Elm.* and *F. microsphaera Warb.* And the following are known as "Basicong"; *F. nota (Blco.) Merr., F. variegata Blm., F. cassidyana Elm., F. satterthwaitei Elm., F. sordidissima Elm., F. peabodyi Elm., F. cuernosensis Elm.* and *F. manilensis Warb.*

An analysis of these species will reveal the fact that to all the liana or lofty tree climbers they apply the name "Cataupi." All the sprawling, shrubby or subscandent species with small axillary fruits are called "Magulipi." And most of the low trees with moderately large fruits upon ligneous branched tubercles from stem and larger branches they know as "Basicong" except the last species mentioned. Curiously enough, these three larger groups named by them and the species they include, are the exact species which belong respectively to the sections *Synoecia, Palaeomorphe* and *Covellia* of *Dr. King's* monograph of the Indo-Malayan Species of Ficus. This fact has led me to believe that there are external characters of our Philippine species by which they can be naturally classified. First, I wish to produce the sections used by *King*.

Group I.—Pseudo-hermaphrodite; male flower with one stamen and a rudimentary pistil; hermaphrodite flowers

and gall flowers in one set of receptacles; fertile female flowers in another set..............................I. *Palaeomorphe*

Group II.—Unisexual or asexual; male flowers without rudimentary pistils.

Section I.—Male, gall and fertile female flowers on the same receptacles..................................II. *Urostigma.*

Section II.—Flowers unisexual or neuter; male and gall flowers in one set of receptacles, fertile female and neuter flowers in another set.......III. *Synoecia.*

Section III.—Flowers unisexual; male and gall flowers in one set of receptacles, fertile female flowers only in another set.

A.—Flowers monandrous.

a. Receptacles chiefly axillary.....IV. *Sycidium.*

b. Receptacles mostly in fascicles from stem and branches...............................V. *Covellia.*

B.—Flowers di rarely triandrous.

a. Receptacles mostly axillary.....VI. *Eusyce.*

b. Receptacles mostly in fascicles from stem and branches.........................VII. *Neomorphe.*

By this key it is exceedingly difficult to bring a species into its rightful section. Our specimen may or may not have staminate flowers, or vice versa. *Dr. Warburg* has already complained of the sectional characters which no doubt led him into a few errors. The writer's own limited study of Philippine *Ficus* has convinced him that there are no divisional characters between the monandrous species with receptacles mostly in fascicles from stem and branches and the di or triandrous species with receptacles mostly in fascicles from stem and branches. Again, the fig flowers are not easily classified by the amateurs, the stamens of certain species are hard to find or even to recognize when they are present. It is no easy matter to detect the young fertile female flowers from the neuter or from the pseudo-hermaphrodite flowers. So I have come to feel that if even a less scientific or natural classification could be evolved from the external appearances it would prove no less serviceable. In the following rough sketch I have outlined such a course for most of our Philppine species, and with further construction it may become at least artificially useful to systematists. In glancing over it

one sees certain species thrown together and in most cases there is no denying of their relationship.

a. Palm-like shrubs.......................................Group I
F. pseudopalma Blco.
F. haenkei Warb.
F. blancoi Elm.

aa. Branched trees, shrubs or vines.

b. Leaves tessellate beneath...............................Group II.
F. apiocarpa Miq.
F. megacarpa Merr.
F. warburgii Elm.
F. antonii Elm.
F. areolata Elm.
F. cataupi Elm.

bb. Leaves not tessellate.

c. Figs on tubercles from stem and occasionally from the larger branches.

d. Tubercles lax, long and slender..........Group III.
F. minahassae Miq.
F. corona King.
F. merrittii Merr.
F. barnesii Merr.
F. linearifolia Elm.
F. cervina Elm.
F. merrillii Elm.

dd. Tubercles rigid, thick and relatively short. Group IV.
F. heteropoda Miq.
F. nota (Blco.) Merr.
F. satterthwaitei Elm.
F. cuernosensis Elm.
F. peabodyi Elm.
F. cassidyana Elm.
F. sordidissima Elm.
F. repandifolia Elm.
F. sulcata Elm.

cc. Figs chiefly in the leaf axils, occasionally clustered along the twigs.

d. Figs sessile, ruber red, subtended by blunt bracts; leaf petioles short. .... Group V.

F. indica Linn.
F. clementis Merr.
F. palawanensis Merr.
F. umbo-bracteata Elm.
F. iwahigensis Elm.
F. altissima Blm.
F. clusioides Miq.
F. vidalii Warb.
F. elastica Linn.

dd. Figs upon long rigid peduncles, yellowish, subtended by sharp bracts; leaf petioles long..... Group VI.

F. chrysolepis Miq.
F. hallieri Merr.
F. longipedunculata (Merr.) Elm.
F. pruniformis Blm.
F. magallanensis Elm.
F. strangularis Elm.

ddd. Figs with other characters except color; leaf petioles short.

e. Figs 2.5 to 5 cm. across, always obovoid. Group VII.

F. variegata Elm.
F. garcia Elm.

ee. Figs less than 2 cm. in diameter, nearly all globose or subglobose.

f. Sprawling, subscandent or scandent shrubs; leaves smooth, with or without hairs. Group VIII.

F. tinctoria Wall.
F. pisifera Wall.
F. celebica Miq.
F. disticha Blm.
F. inaequifolia Elm.
F. confusa Elm.
F. microsphaera Warb.
F. propinqua Merr.
F. villosa Blm
F. recurva Blm.

F. copelandii C. B. Rob.
F. todayensis Elm.
F. caudatifolia Warb.
F. puncticulata Merr.

ff. Erect shrubs, seldom trees; leaves harsh at least beneath.................................Group IX.

F. ulmifolia Lam.
F. fiskei Elm.
F. arayatensis Warb.
F. celtoides Elm.
F. irisana Elm.
F. guyeri Elm.
F. angustissima Merr.
F. sibuyanensis Elm.
F. terminalifolia Elm.
F. multiramea Elm.
F. arenata Elm.
F. ampelas Burm.
F. elmeri Merr.
F. subintegra (Merr.) Elm.
F. asperrima Miq.

fff. Erect shrubs or trees; leaves smooth not harsh, with or without hairs.

g. Leaves 2 to 3 dm. long, one half as wide.................................Group X.

F. gigantifolia Merr.
F. malunuensis Warb.
F. cordatula Merr.
F. sericea C. B. Rob.
F. cordatifolia Elm.

gg. Leaves smaller.

h. Leaves hairy beneath; fruits densely pubescent.................................Group XI.

F. macropoda Miq.
F. luzonensis Merr.
F. glareosa Elm.
F. ruficaulis Merr.
F. paloensis Elm.

hh. Leaves and fruits glabrous or subglabrous.

i. Leaves elliptic, numerously pinnatinerved..........Group XII.
F. gabella Blm.
F. umbrina Elm.
F. calophylloides Elm.
F. decaisniana Miq.
F. infectoria Roxb.

ii. Leaves cordately ovate, fewer nerved..........Group XIII.
F. banahaensis Elm.
F. integrifolia Elm.
F. latsoni Elm.
F. saxophila Blm.
F. ahernii Merr.

iii. Leaves oblong not pinnatinerved.

j. Leaves coriaceous; figs soft skinned..........Group XIV.
F. hauili Blco.
F. benguetensis Merr.
F. lucbanensis Elm.
F. laxiramea Elm.
F. carpenteriana Elm.
F. laevicarpa Elm.
F. cardinalicarpa Elm.
F. pustulata Elm.

jj. Leaves chartaceous; figs hard skinned..........Group XV.
F. bataanensis Merr.
F. crassitora Elm.
F. sibulanensis Elm.
F. apoensis Elm.
F. similis Merr.

The natives in this region make use of the soft, pulpy and fibrous wood from the stems of the liana-like climbers belonging to the *Synoecia* or "Cataupi" group. The stem is cut up into small chunks and is chewed by them with their betlenut, lime and cuyo or tobacco leaf. The soft wood fiber makes their chewing ration last longer. I have known them to carry the concoction in their mouths all day while on trips and during resting

moments they would keep the wood on either side between their upper teeth and upper lip, giving the lip a swollen or punched up appearance. Usually, however, they take several chews a day, and the more rushing the work is the oftener they will want to take chews.

The study of Davao figs disclosed a strong Pacific coast distribution northward through eastern Luzon. This is corroborated by other groups as well. Examples of these are *F. caudatifolia Warb.*, *F. banahaensis Elm.*, *F. inaequifolia Elm.*, *F. lucbanensis Elm.*, *F. altissima Blm.* and *F. cassidyana Elm.* Such as the first ones mentioned are found more interiorly upon high mountains yet where they have the influence of the Pacific ocean.

List of the species.

Ficus confusa Elm.

Field-note:—A tree climber; stem 1 to 2 inches thick, suberect, laxly rebranched and forming hanging masses from the tree trunks; bark smooth and yellowish gray on the twigs; wood moderately soft, yellowish, porous, a trifle fetid and bitter; leaves descending, nearly flat, tips slightly recurved, chartaceous, deeper green above; figs hard, smooth, yellowish green, with some milk spots, solitary or 3 or even 5-clustered in the leaf axils, 0.33 inch in diameter, very similar in appearance to green coffee berries, the umbilicus reddish.

Represented by number 10501, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

Collected in humid woods at 4000 feet. In the Bagobo dialect it is called "Magulipid."

F. subulata Blm. is very similar.

Ficus celebica Blm.

Field-note:—Subepiphytic upon or about the basal portion of other trees; stem 3 inches thick, its branches numerous and laxly spreading; wood quite hard, white, odorless and tasteless, rather heavy; bark smooth, yellowish gray; leaves chartaceous, only the tips recurved, dull green above, paler beneath, its veins dull yellow, the margins usually somewhat recurved; figs clustered

in the leaf axils or along the slender twigs, yellowish red, soft, nearly glabrous and wholly red when mature.

Represented by number 10711, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

In very humid canyons along the Baruring river at 3500 feet. It usually grows about trees near the ground and occasionally it sprawls over huge bowlders or attaches itself into rock crevices upon cliffs. The Bagobo name is "Magulipid."

Just what *F. lancifolia Miq.* is I do not know. Possibly it is one of the very pubescent forms of middle and northern Luzon.

Ficus inaequifolia Elm.

Field-note:—An erect tree or shrubby, 20 feet high and 6 inches thick; branches numerous, grayish; wood dull white throughout, odorless and tasteless, rather brittle, plainly grained; bark grayish white and more or less blotched; leaves varying, the terminal usually larger, tips recurved, paler beneath, the main nerves whitish on the nether side; figs less than 0.5 inch through, solitary or in pairs from the leaf axils or from the axils of their scars, ascending upon yellowish green peduncles, the receptacle of the same color and only sparingly brown spotted, umbilicus small.

Represented by number 10460, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

Along the Sibulan river at 2000 feet. This is the third time it has been collected by the author, otherwise unknown. Quite typical and rare, in all of the three localities only a single plant was found. The Bagobos call it "Magulapi."

Ficus microsphaera Warb.

Field-note:—A straggling climber; stem 1 to 2 inches thick, irregularly rounded; branches widely spreading, slender and lax, mostly reclining or drooping; wood moderately hard and tough, sappy white, odorless and tasteless; bark dull green or grayish brown; leaves membranous, flat but with strongly recurved tips, much greener above; figs clustered both in the leaf axils or in the axils of the fallen leaves, globose, 0.25 inch in diameter, soft and red when mature, upon short similarly closed peduncles.

Represented by number 10806, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

In wet, deeply shaded places along the Baruring river at 3000 feet altitude. "Magulipid" is the vernacular name given it by the Bagobos.

Dr. Copeland collected it three times in this locality and all of his specimens are exactly like mine. Forestry Bureau number 9323 from port Banga, district of Zamboanga, comes nearer the description. Not known from other localities.

Ficus caudatifolia Warb.

Field-note for 11239:—A straggling climber; stem 6 inches thick, reaching 25 feet in length, branched all along; branchlets divaricately spreading, ultimately numerously and laxly rebranched, its twigs reclining or subpendant; bark smooth, mottled; wood rather tough, odorless, whitish, with a faint sweet taste; leaves chartaceous, descending, flat but with apices recurved, smooth and sublucid above, slightly rough beneath; figs axillary, solitary or in pairs, pendulous from the whitish slender peduncles, when immature greenish white and with numerous milk spots, flatly globose, 0.5 inch thick, harsh, occasionally beset with vestiges of bracts as are also the peduncles especially so at the base, red and smoother when ripe.

Represented by numbers 11239 and 10486, *Elmer*, Todaya (Mt. Apo), Mindanao, May and July, 1909.

Gathered in good soil of humid forests at 3500 feet. A wouldbe strangler but without the cleaving power. A very characteristic species scattered throughout the eastern or Pacific coast portion of our archipelago. Number 11239 the Bagobos call "Magamomos" and number 10486 they call "Magulepit."

Ficus flavo-cortica Elm. n. sp.

A low spreading tree; trunk 15 m. high, nearly 5 dm. thick, terete; main branches toward the top, widely spreading and rather numerously rebranched, the ultimate ones lax and more or less drooping; old bark brown, on the branches grayish mottled; wood light, whitish, strongly ringed, without odor or taste; twigs refous pubescent especially dense toward the tips; bark beneath flavus. Leaves sessile or upon very short brown pubescent petioles, chartaceous, flat, horizontally spreading or

only slightly descending, dull green on the glabrous upper surface, paler or slightly pubescent on the nether side, alternatingly scattered, comparatively few and mostly toward the ends of the twigs, slightly roughened on both sides, very unequal in size, oblong, occasionally a trifle unequally sided, abruptly terminating into an acute or acuminate apex, base subtruncate or broadly rounded, entire or apiculate or minutely dentate above the middle, the larger ones 15 cm. long by 5 cm. wide across the middle; midvein conspicuously raised beneath, with 5 to 7 lateral pairs or fewer in the small blades, ascendingly curved, tips anastomosing, also prominent, the reticulations quite evident, all finely brown pubescent; bud bracts or stipules submembranous, less than 1 cm. long, linearly acuminate, soft pubescent on the dorsal side.

Receptacle globose, sessile, 7.5 mm. thick, creamy white, usually clustered in the leaf axils or in their scars along the twigs, felty pubescent, minutely papillose above the middle to the apex; umbilicus not conspicuous, aperture circular and openly guarded by the numerous protruding bracts, the inner bracts extending the opposite direction; bracts 2 or 3, ciliate especially along the margins, acuminate, at least 2 mm. long; flowers pseudohermaphrodite and gall only, the imperfect ones in the region of the umbilicus; gall flowers sessile; perianth of 4 segments, hyaline with brownish central regions, 2 mm. long or longer, acuminate oblong to lanceolate, occasionally with few fine ciliate hairs; gall ovary 1 mm. across, somewhat compressed or lenticular, otherwise globose, sessile, greenish brown; style terminal, very slender, yellowish, as long as the ovary, smooth; stigma reddish brown, disk-like or obscurely lobed.

Type specimen 10922, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Discovered in very damp suballuvial soil of dense forests at 3500 feet, just north of the Baruring river flat on the trail to Talon. The Bagobos know it as "Magulipe" though I have seen only two plants during my seven months exploration work in that vicinity.

More differential in the field than as herbarium specimens. This is neither of its two closely allied species *F. pisifera Wall.* nor *F. celebica Blm.* according to *King's* monograph. Its closer affinity, however, is to the latter. What *Miquel's F. lancifolia* really is I do not know.

Ficus altissima Blm.

Represented by number 11971, *Elmer*, Todaya (Mt. Apo), Mindanao, October, 1909.

Tall tree, collected in deep forests along the coast toward Digos.

A good match of *Blume's* species. Typical specimens are rarely collected and so far known only on the southeastern Pacific coast portion of the Philippines.

Ficus indica Linn. *Urostigma tsjela Miq.* in Lond. Journ. VI; 580.

Field-note:—A 60 feet high tree with a 3.5 feet thick stem; main branches from above the middle, widely spreading, ultimately numerously rebranched, the twigs quite lax; wood white, coarsely grained, soft, odorless and tasteless; bark mottled, lenticelled, containing latex; leaves ascending or horizontal to descending, coriaceous, flat, with recurved tips, deep green and somewhat shining on the upper side, much lighter green beneath; figs solitary or in pairs from the leaf axils, dark brick red, with greenish yellow spots.

Represented by number 11612, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

Gathered in fertile soil of woods at 3500 feet of mount Calelan. The Bagobos call it "Marobutim."

Ficus hallieri Merr.

Field-note:—Tall tree; stem 4 feet thick, 75 feet high, at the middle divided into main ascending branches; wood white, soft, conspicuously ringed, odorless and tasteless; bark smooth, elegantly mottled; branches ultimately numerously rebranched and widely scattered; leaves descending, smooth on both sides, dark green on the upper conduplicate surface, with recurved tips, much paler beneath, the main nerves yellowish green, with brown sides; figs usually in pairs from the leaf axils, upon a 0.75 inch long triangularly thick peduncle which in the early state is strictly ascending and subtended by brown deciduous bracts, yellowish green and with numerous milk spots of irregular sizes, subtended by 3 similarly colored bracts, subglobose, 1 inch in diameter, the nearly closed umbilicus somewhat raised.

Represented by number 11080, *Elmer*, Todaya (Mt. Apo), Mindanao, July, 1909.

In dry woods of fertile soil at 1500 feet or about the upper terminus of the cogon formation. The natives or Bagobos call it "Mararag."

Ficus palawanense Merr.

Field-note:—Not a large but widely spreading tree, originally epiphytic; branches gray and smooth; leaves rigidly coriaceous, flat except the recurved tips, shining green on the upper side, only slightly paler beneath; figs solitary or in pairs from the leaf axils, hard, deep red, subtended by rigid bracts.

Represented by number 11976, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

Collected in woods near the seacoast at Daron. Apparently widely scattered throughout the middle and southern portion of our archipelago but nowhere common. "Acob" is the Bagobo name.

Ficus clementis Merr.

Field-note:—An apparently large spreading tree, epiphytic when young: stem 6 feet thick, messed, branched from below the middle; main limbs horizontally spreading, the ultimate ones rather numerous; twigs green, rigid, suberect, 0.5 inch thick; wood moderately soft, whitish, coarsely grained, odorless and tasteless; bark brownish and mottled, the old bark lenticelled, freely bleeding with latex; leaves horizontally spreading or descending, rigidly coriaceous, deep green and lucid on the upper shallowly conduplicate surface, paler beneath, the veins yellowish white; figs mostly in pairs, hard and yellow, tightly attached in the rigid yellowish green sessilely inserted involucral bracts, 0.5 inch across, 0.75 inch long, equally rounded at both ends.

Represented by number 10952, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

In woods of dry soil between the upper limit of the cogon patches and the Baracatan creek depression at 1500 feet. Chiefly known from the lake Lanao, central Mindanao region. The Bagobos call it "Mararag."

Ficus retusa Linn.

Field-note:—A strangling epiphyte, arising from the lowermost limbs of a large tree; branches widely spreading, quite rigid; the ultimate ones numerous, erect or nearly so, flexible; wood whitish, rather tough, without odor or taste; bark smooth, grayish white mottled; leaves rigidly coriaceous, ascending, deep dull green on the upper nearly flat surface, much lighter or yellowish green on the nether side; figs in pairs from the leaf axils, the subtending bracts also yellowish green, less than 0.5 inch long, obovoidly ellipsoid, hard and dull red.

Represented by number 11314, *Elmer*, Todaya (Mt. Apo), Mindanao, August, 1909.

Upon a large *Castanopsis* tree, in humid forest at 4000 feet, just south of the Sibulan river near the trail to camp Baclayan. Called by the Bagobos "Marobutam."

Not *F. indica Linn.* because leaves strongly trinerved and apices rounded, occasionally retuse. *Dr. King* describes *F. retusa Linn.* as a tree, but that may be so in old plants under certain conditions.

Ficus umbrina Elm.

Field-note:—A strangling climber upon or about large tree trunks; stem freely branched and forming a network about its host or support; main branches 20 to 30 feet long, divaricate, freely branched beyond the middle; twigs hanging, dense or numerous, flexible or very tough; bark smooth, mottled; wood soft, fibrous, odorless and with a slight sweet taste; leaves coriaceous, usually conduplicate on the upper very deep green surface, especially so toward the recurved apex, the blades descending, upon ascending greenish brown petioles; figs in pairs from the leaf axils, without proper peduncles, subtended by bracts or at least vestiges of bracteoles, somewhat irregularly rounded, hard, dark creamy or yellowish white and tinged with a little red, obovoid, the base much constricted into a false stalk, sessile, apex sunken, the minute umbilical scales brownish red.

Represented by number 11241, *Elmer*, Todaya (Mt. Apo), Mindanao, July, 1909.

On a wooded ridge along the Baracatan creek at 2250 feet. "Robuttum" is the Bagobo name.

This rare species is only known besides the type by a specimen from mount Mariveles. All of these three specimens are alike in fruits and leaf character. *Cuming* 1932 or *F. nuda Miq.* is more likely to be what *King* considers the commoner *F. benjamina Linn.* with deep red globose fruits. To this same alliance belongs *F. haematocarpa* (*Miq.*) or *Urostigma haematocarpum Miq.* in Lond. Journ. VI; 584.

Ficus infectoria caulocarpa (Miq.) **King.** *F. stipulosa Miq.* Ann. Mus. Bot. Ludg. Bat. III; 287. *Urostigma caulocarpum Miq.* Fl. Ind. Bat. I; 334.

Field-note for 11014:—An epiphytic strangler, starting in the axils of large tree limbs and ultimately forming a mess work of stems and roots about its host; branches widely spreading, twigs slender and ascending; wood soft, dirty white, odorless and tasteless; bark very smooth, brown and gray mixed; leaves horizontally spreading, coriaceous, nearly flat, smooth on both sides, deeper green above, their petiole and main nerves yellowish white; figs in pairs from the axils of fallen leaves beneath the foliage, ascending upon green peduncles, obovoid, smooth, flat across the umbilicus, yellowish when fully mature and with bright red spots.

Represented by numbers 11014 and 11042, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

In dry woods of a ridge along the Baracatan creek at the upper limit of the cogon formation at 1500 feet.

All our Philippine material comes under the species with sessile fruits, under the variety when its fruits are short pedicelled. Both of *Miquel's* names are quite the same as *Roxburgh's* older name of this very characteristic species. The Bagobo name is "Magamomo."

Ficus calophylloides Elm. n. sp.

A large widely spreading tree; trunk 1.5 m. thick, terete, 20 m. high; main branches divergently spreading, the ultimate ones numerous, rigid and relatively short; bark on the twigs brown and densely covered with lighter brown lenticels. Leaves alternatingly scattered, usually toward the end of the short stout twigs, coriaceous, nearly flat, darker green and more shin-

ing on the upper surface, only the short obtuse to acute tips recurved, glabrous, elliptic, base broadly obtuse, entire, the average blades 10 cm. long, 6.5 cm. wide across the middle, greenish brown when dry; midvein very prominent beneath, straight from base to apex, smooth and glabrous; lateral nerves oblique, numerous, parallel, tips interarched and forming a conspicuous submarginal nerve from base to apex, similar to the nerves in *Calophyllum*, reticulations evident; petiole 2.5 cm. long, also glabrous, deeply grooved along the upper side; bud bracts rigid, sharply acuminate, smooth, 1.5 cm. long, one half as wide across the base, deciduous.

Receptacles solitary or in pairs from the leaf axils, ellipsoid, 2.5 cm. long, smooth, hard, yellowish when mature; peduncle very short, 5 mm. long, 3.5 mm. thick; bracts obsolete or occasionally present by a thick rim which usually does not encircle the base of the fruit; umbilicus minute, the inner bracts rather short and broad, smooth, light brown; flowers male and gall only or perhaps the intermixed young ones are fertile females; the male in a circle beneath the umbilical scales, 3.5 mm. long, subtended at the base by an involucre; stipe nearly 2 mm. long, brown, angular and curved, 1 mm. thick; basal bracts 3 to 5, unequal, also brown, glabrous, oblong to lanceolate; anther 1, subsessile upon the pedicel, 2-celled, 0.75 mm. long, a trifle narrower, closely enveloped by 3 rather rigid spoon shaped bracteoles; gall flowers scattered, of diverse ages, very similar to the male flowers except that the basal bracts are thinner and narrower; gall ovary obliquely subglobose, 1.5 mm. across, smooth and shining, yellowish brown; style slender, 2 mm. long, similar in color, arising laterally, terminated by a flattened stigmatic portion.

Type specimen 11921, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October, 1909.

Discovered on a steep densely wooded bench along the Sibulan river at 2500 feet altitude. The Bagobo name is "Marobutum."

Judging from both leaf character and fruits ours is most closely related to *F. dubia Wall.* and *F. calophylla Blm.* yet quite distinct from either.

Ficus umbo-bracteata Elm. n. sp.

A medium sized tree, with spreading branches; twigs rigid,

wrinkled in the dry state, yellowish gray, more or less lenticelled, glabrous; wood soft, coarsely grained; bark grayish white mottled. Leaves alternatingly scattered but chiefly toward the ends, caducous, leaving large oval scars, rigidly coriaceous, smooth and glabrous, nearly flat, apex abruptly terminating into a sharp acute 1 cm. long recurved point, base obtusely to truncately rounded and with minute auricular lobes, entire, elliptically oblong, the larger blades 2 dm. long by 1 dm. wide across the middle; midvein very bold beneath, smooth and glabrous, caniculate along the upper side; the primary 7 to 9 lateral pairs ascending especially the subbasal pair, similar in boldness and vestiture, ascendingly curved and interarching toward and with their ends, articulations quite evident; petioles very stout, subcompressed, glabrous, green, striate along the upper side; bud bract deciduous, very rigid, folded, 2 cm. long, smooth and brown on the inner side, densely velvety on the outer exposed portion, triangularly oblong and terminating in an acuminate point.

Receptacle solitary or in pairs of the leaf axils, truncate at the ends especially the upper end, 3 cm. long, 2 cm. thick, dull deep red and sprinkled with lighter red lenticels, sessile or nearly so; bracts 3, rotately spreading, green, rigid, ovately triangular, united at their bases, 5 to 7.5 mm. long, smooth, the central basal portion usually developed into 2 bosses or umbos which seem to cleave around the branchlet to which the receptacle is attached; umbilicus flat, covered over by 2 or 3 small rigid scales, most of the inner scales transversely overlapping, rigid, broad and irregular; flowers male and gall only; the male flowers scattered throughout the upper one half of the syconium, 4 mm. long; its pedicel yellow, curved, nearly 2 mm. long by 1 mm. thick; the single anther covered over by a dark brownish red and rigid perianth, 1.25 mm. long, cordately ovate in shape, with a rigid nearly black connective; gall flowers upon shorter pedicels; the ovary covered by a similar perianth, reddish brown; young style 1.5 mm. long, brown, terminated into a linear nearly black stigmatic portion; all flowers at least when young subtended by linear bracts upon the syconium.

Type specimen 11956, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

On rock ledges along the Sibulan river at 2750 feet. The Bagobos call it "Ucong."

Possibly it should better be considered a variety of *F. palawanensis Merr.* but fruits are entirely too large.

Ficus apoensis Elm. n. sp.

An exceedingly large straight tree; trunk 20 or more m. high, to 1.5 m. thick, branched above the middle, with small buttresses; main branchlets slender, divaricate, lax, their tips yellowish brown; wood light and soft, with conspicuous concentric rings, yellowish white, without odor or taste; bark blackish brown and smooth; young twigs glabrous. Leaves chartaceous, descending, only slightly conduplicate and recurved toward the apex, lucid, green above, yellowish green beneath, alternatingly scattered along the branchlets, glabrous, exceedingly variable in size, entire, apex narrowly acuminate, the smaller ones lanceolate, the larger blades elongated oblong, 3 dm. long by 7.5 cm. wide across the middle, base obtuse or in the smaller ones subcuneate, drying deep brown especially on the under side; midvein stout, boldly raised, its sides with appressed deciduous hairs, deeply grooved on the upper side; lateral pairs 10 to 15, ascending, also prominent, subparallel, strongly and conspicuously ribbed together, the subbasal pair much more ascending and running along the margins, reticulation quite evident; petiole glabrous, very strong, 2 cm. long, channelled along the upper side; buds 1 cm. long, glabrous, finely acuminate, usually curved to one side.

Receptacles axillary, solitary or in pairs, globose, hard, dull green, covered with minute yellowish spots, 1.5 cm. in diameter; peduncle yellowish green, 1 to 1.5 cm. long, glabrous, ebracteate, umbilicus minute, scarcely raised, guarded by very small imbricated bracts, the inner ones oblong and pendant; flowers male and gall only or with a few sterile ones mixed in between; male beneath the inner umbilical scales, monandrous, glabrous, dark brown, 4 mm. long; pedicel 2.5 cm. long, rather stout, curved, bearing at the distal end 4 lanceolate segments which are united below the middle and surround the real but slender pedicel; stamen 0.75 mm. long, fully as wide, upon a short stalk, light yellow, encased by a sheath or secondary perianth; gall flowers scattered, similar to the male; gall ovary straw brown, smooth, obovoid, 1.25 mm. long; style lateral, oblique, only one half as long, reddish brown especially toward the scarcely enlarged stigma.

Type specimens 10877 and 10708, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May to June, 1909.

The first cited number was collected in very moist rich soil of a densely forested flat at 3750 feet or at the base of mount Calelan; the last number cited in similar places near the Baruring river along the trail to Talon. In this latter sitio are a number of immense trees with perfectly straight and round boles, 5 feet through and 75 to 100 feet long. Both of them were named for me by the Bagobos as "Tapasan."

My number 10264 from Negros is the same and was on page 537 of this publication reported under *F. nervosa Hey.*

Ficus cordatifolia Elm. n. sp.

Tree, with a 15 m. high and 6 dm. thick stem; trunk not straight, terete, buttressed at the base; wood moderately soft odorless, with a slight sweet taste, its concentric rings fine; bark grayish white, smooth; branches chiefly at the top, forming a flattish crown, crookedly rebranched, the twigs 1.5 cm. thick and ascendingly tipped. Leaves glabrous, coriaceous, turning bright brown while curing, alternatingly clustered toward the ends of the twigs, horizontally spreading, somewhat recurved and conduplicate on the upper richly lucid green surface, a trifle yellowish green beneath, cordately ovate to oblong or subelliptic, entire, the average blade 2 dm. long by 1.5 cm. wide below the middle, apex gradually rounded, base broadly but not deeply cordate; midvein stout, more apparent from the nether side, smooth and shining yellowish green, straw brown when dry; lateral nerves 7 to 9 on each side, a secondary primary pair arising from near the base, the others oblique, also prominent on both sides, their tips united by arches less conspicuous, articulations fine and relatively bold on both surfaces; petiole green, glabrous, ascending, stout, 2 to 7.5 cm. long; bud bracts densely covered with cinereous hairs, imbricate, 1 cm. long, acuminate.

Receptacles pendulous, usually in pairs from the lower leaf axils, perfectly globose, smooth and subglaucescently green, nearly 2.5 cm. in diameter; peduncle also smooth, yellowish green, slender, 2 to 3 cm. long, with a fringe of bract vestiges 5 mm. long below the receptacle; umbilicus small, raised, guarded by the soft tips of the inner protruding scales; flowers apparently gall

and male; male confined to the regions of the umbilical scales, 3.5 mm. long, monandrous usually although one flower contained 2 anthers, completely enveloped by a reddish brown gamophyllous perianth; gall flowers 1 mm. longer, with a longer and curved stipe, the perianth 5-segmented clear to below the ovary; ovary yellowish brown, shining, ellipsoid, 1.5 mm. long; style arising from the side, 1 to 2 mm. long including the stigma.

Type specimen 10997, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June, 1909.

Discovered in dry soil of woods along the ridge of the Baracatan creek at 1500 feet and bordering the upper limits of the cogon areas. The native or Bagobo name is "Magalangit."

The leaves are like those of *F. cordatula Merr.* and *F. sericea C. B. Rob.* from this same general region, and are strikingly similar to *F. gigantifolia Merr.* and *F. malunuensis Warb.* of a more northern range. Only critically distinguished from the latter by the shorter leaves whose bases are not rotund to subtruncate, lateral nerves always less than 9 on each side; peduncles also shorter, bearing receptacles not broadly elliptic and which are never puberulous.

Ficus cataupi Elm. n. sp.

A lofty tree climber; branches ashy gray mottled, flexible, crookedly rebranched and forming a more or less interlaced mass along the upper side of large limbs; twigs numerous, short, virgate, wrinkled in the dry state, reddish brown and puberulent to short pubescent on the young tips. Leaves ample, alternate, rigidly chartaceous, acute tips recurved, mainly horizontally disposed, glabrous above, subglabrous beneath, pale or yellowish green and tessellately marked or punctured, variable in size, the entire margins involute, base rounded but occasionally obtuse, broadly lanceolate to ovately oblong, the larger blades 7.5 cm. long and 3.5 cm. wide below the middle; midvein prominently raised beneath, only sparsely strigose; the 5 to 7 lateral nerves on each side divaricate, ascendingly curved toward their ends which are interarchingly united, less pronounced, the fine reticulations obscure; petiole less than 1 cm. long, stout, ascending, at first strigose, ultimately brown and subglabrate; bud bract linearly acuminate, finally becoming subglabrous, 5 to 7.5 mm. long.

Receptacles peduncled, solitary in the leaf axils, ellipsoid, hard and blotched with brown, apparently turning soft and purplish when fully ripe, 5 cm. long, at least 3 cm. across the middle, smooth; peduncle very short and thick, terete, subtended by short and rigid bracts or none; umbilicus nipple shaped, the opening small and circular, the inner bracts subhyaline or brown, broadly oblong; flowers male and gall only, all intermixed; staminate ones monandrous, subtended by linear 2 mm. long brown colored bracts or scales pedicel whitish, twisted and looped, 5 mm. longer or 1 to 2 mm. long irregardless of the attachment of the perianth; perianth brown, not rigid, subgamophyllous or splitting up into 3 segments nearly 1.5 mm. in length, attached 1 or 2 mm. beneath the anther; anther curved dorsally, 1.5 mm. long, nearly as broad, ends truncate except the shallow notches, pale yellow; pedicel of gall flower brown, 2 mm. long, nearly ebracteolate or the bracts reduced to a short tube encircling the pedicel, glabrous; gall ovary reddish brown, short ellipsoid or ellipsoid, nearly 2 mm. long, strict, 1 mm. long, sublateral, terminated by a small darker brown stigma.

Type specimen 11822, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

On a sharp densely forested ridge trail leading out of the very wet or humid Mainit creek bottom toward Baclayan at 4500 feet. To this species the Bagobos unmistakably apply their own vernacular name "Cataupi."

Distinctly allied to *F. apiocarpa Miq.*

Ficus areolata Elm. n. sp.

A liana-like climber; old stems 7.5 cm. thick, somewhat flattened; branches quite numerous at the top, rigid; wood white, rather solid and tough, with a large pith; bark on stem gray and brown mottled, tough and easily peeling along the branchlets, the young glabrous portion dull brown in the dry state, more or less sprinkled with minute lenticels. Leaves alternatingly scattered along the branchlets, coriaceous or subchartaceous, glabrous, dull green above, lighter and tessellate beneath but when dry dark brown or dull copper color, usually descending, entire but the margins revolute even so in the dry state, oblong to elliptish, the average blade 12 cm. long by one half as wide across

the middle, gradually rounded toward the top which bears an abrupt 5 mm. long point, base obtuse to subcuneate and obscurely emarginate; the smooth midvein very prominent beneath, with 7 ascending lateral pairs whose distal ends coalesce and form a submarginal vein, cross bars and reticulations relatively obscure; petiole stout, flexible, 2.5 cm. long, subcompressed, striately caniculate along the upper side, glabrous but when old scurfy brown; stipules subpersistent, appressed, glabrate, sharply acuminate, 1 to 1.5 cm. long, brown when dry.

Receptacles perfectly globose, solitary or 1 to 3-clustered from the leaf axils or from their scars along the branches, smooth, yellow except the deep red skin which when fully mature turns to wine color, 1.5 cm. in diameter; peduncle green and glabrous, less than 1 cm. long, arising from very short tubercles, at the upper end subtended by 3 bract-like scales; umbilicus small, smooth or even with the receptacle curvature, covered over with short thick scales, the inner inwardly pointed scales linear lanceolate, brown and quite rigid; flowers apparently all fertile female, intermixed with sterile slightly pubescent pedicels or paraphyses 3 mm. long; perianth smooth, purplish brown, splitting into 3 or 4 oblanceolate or spatulate segments; pedicel flattened, hyaline, 1.25 mm. long; ovary or seed pale brown, oblong from the side view, compressed, smooth and crustaceous; style subterminal, obliquely curved, terminated into a darker brown setaceous point.

Type specimen 10475, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Collected in moist fertile soil of humid forests at 4000 feet. The Bagobos also know this as "Cataupi."

This new species is nearest related to *F. apiocarpa Miq.* but fruits and especially the leaves very different. *Mrs. Clemens* has also collected it in the lake Lanao region of central Mindanao.

Ficus hauili Blco.

Field-note:—Small erect tree or shrubby; wood dull white, soft, odorless and tasteless; bark smooth, yellowish gray or grayish white, covered with brown lenticels; leaves quite rigid and thick, flat or only slightly recurved, descending, pale green especially on the lower surface, nerves whitish; figs solitary or in pairs of the leaf axils, erect or suberect, upon 0.5 inch long green peduncle;

syconium thick, hard, dark green especially toward the shallowly ridged apex and sprinkled with minute white spots; flowers creamy white.

Represented by number 10522, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

Inhabiting thickets of fertile soil on the eastern slope of *Angat's* knoll at 4250 feet. "Latayi" is the Bagobo name.

Possibly *F. didymophylla Warb.* should be reduced to *Father Blanco's* name, at least it belongs to the same section.

Ficus lucbanensis Elm.

Field-note:—Shrub 12 feet high; branches widely spreading, lax, the green terminal portions of the twigs ascending; bark smooth, mottled; wood soft, odorless and tasteless, yellowish white; leaves horizontally spreading, slightly recurved toward the tip, thinly coriaceous, deep dark green above, much lighter beneath, the main nerves yellowish white; figs clustered upon short tubercles, from the leaf axils or from the axils of fallen leaves, subglobose, 0.5 inch in diameter when mature, dark green, covered with small yellowish brown lenticels.

Represented by number 11800, *Elmer*, Todaya (Mt. Apo). Mindanao, September, 1909.

Inhabiting rich humus covered soil of dense forests at 4000 feet of mount Calelan. The Bagobo vernacular name is "Alian."

Quite typical and in this state readily distinguished from *F. hauili Blco.*, both in the field and herbarium. Not certainly known from other localities.

Ficus banahaensis Elm.

Field-note for 10905:—Small tree; stem 6 inches thick, 18 feet high, only sparingly branched above the middle and divaricately spreading; wood light, soft, odorless and without taste; bark grayish or mottled, brown on the branches; twigs 0.5 inch thick, their tips suberect; leaves terminally clustered, ascendingly spreading from the brown suberect and subterete petioles, flat with only the tips recurved, subcoriaceous, much paler green beneath, the larger veins on the nether side yellowish green; figs clustered immediately beneath the foliage, obovoidly glob-

ose, with a sunken apex, lemon yellow, upon yellowish green more or less angular and apically thickened peduncles.

Represented by numbers 10905 and 10558, *Elmer*, Todaya (Mt. Apo), Mindanao, May to June, 1909.

In loose dry ground of steep places along a forested ridge at 4750 feet of mount Calelan. The vernacular Bagobo name is "Banacol."

This is the first time it has been rediscovered and it seems quite typical of my mount Banahao specimens. It is related to *F. alba Reinw.* of Malay.

Ficus manilensis Warb.

Field-note:—A middle sized tree; trunk 40 feet high, 1.5 foot thick, crooked, not round, obscurely buttressed at the base; branches arising from above the middle, crooked and widely spreading, the lax ultimate ones numerous and more or less drooping; bark gray mottled on the stem, brown on the twigs; wood rather brittle, coarsely grained, whitish throughout, odorless and with a slight sweet taste; leaves rough, chartaceous, descendingly spreading, flat and with recurved tips, dull green on both sides although lighter beneath, nerves yellowish green, the old petioles becoming brown covered; figs dark green, in the leaf axils or in the axils of their scars below the foliage.

Represented by number 10850, *Elmer*, Todaya (Mt. Apo) Mindanao, June, 1909.

On steep wooded slopes along the Baruring river at 3000 feet. "Basicong" is the native or Bagobo name.

Very close to *Miquel's* two species *F. rudis* and *F. polycarpa.*

Ficus angustissima Merr.

Field-note:—Lax shrub, 5 to 7 feet high, stems and branches terete, rather tough, covered with smooth gray bark; leaves scattered, chartaceous, slightly paler green beneath, rough on both sides, ascending, gradually recurved toward their slender tail-like apices; figs subglobose, less than 0.5 inch in diameter, roughened with minute lenticels, yellowish green, upon short green peduncles, solitary or in pairs from the leaf axils, its umbilical scales reddish.

Represented by number 11852, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

Inhabiting good humus covered soil of light woods on a steep slope along the Sibulan river at 4000 feet. Nowhere common in the Philippines and usually on bluffs along water courses at middle elevation. "Ropit" is the Bagobo name.

Merrill's type has opposite leaves. *F. irregularis Miq.* has alternate leaves. Our material has both opposite and alternate leaves. However, all our Philippine specimens have much larger fruits than *Miquel's* little known yet very distinct Celebes species.

Ficus guyeri Elm.

Field-note:—Shrub-like tree, 15 feet high; main branches arising from below the middle, ascending, ultimately numerously rebranched; twigs very slender, brown, usually with ascending tips; wood rather soft, odorless and tasteless, whitish; bark smooth, brightly mottled; leaves chartaceous, horizontal or ascending, with recurved tailed apices, deep green and somewhat shining on the upper side, much lighter beneath; figs descending, usually single from the leaf axils, globose, 0.33 inch in diameter, yellow, with red conspicuously raised umbilical scales, ultimately soft and deep red all over, upon yellowish green pedicels.

Represented by number 11775, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

In moist soil among rocks of shaded woods along the Sibulan river bottom at 2500 feet altitude and near the spray of that magnificent falls. "Diagaring" is the Bagobo name.

It can easily be confused with *F. ampelas Burm.*

Ficus carpenteriana Elm.

Field-note:—Small shrub-like tree, 20 feet high and 6 inches thick; stem branching from the middle or below it, crookedly rebranched; wood whitish, soft, without odor or taste, the concentric rings conspicuous; bark smooth, mottled; leaves horizontally spreading, flat or only recurved toward the apex, chartaceous, very deep green above, much lighter beneath; figs clustered in the leaf axils, subtended by green bracts besides

the involucre, globosely flattened, 0.75 inch across, dark green, with minute pale white lenticels, finely pubescent.

Represented by number 11081, *Elmer*, Todaya (Mt. Apo), Mindanao, July, 1909.

Collected in good soil of woods skirting small streams at 1500 feet altitude. The native or Bagobo name is "Sangi."

The leaves of this material have shorter tips and on the whole our specimens are much less hairy. It has also been collected in the lake Lanao region of this same island. Its relationship is clearly with *F. benguetensis Merr.* and the two varieties.

Ficus laxiramea Elm. n. sp.

A lax shrub; stem 3 to 5 m. high, 4 cm. thick; branchlets slender, not very numerous, tips glabrous and ascendingly curved; wood nearly white, moderately soft, odorless and without taste; bark smooth, greenish mottled. Leaves alternatingly scattered toward the ends of the fine branchlets, descending, glabrous, drying greenish, flat, much lighter green beneath even so in the dry state, the acute apex recurved, the basal one half more distinctly inequilateral, submembranous, gradually tapering from the middle to the cuneate base, margins entire, quite variable in size, the average blade 1 dm. long by 3 cm. wide above the middle, broadly oblanceolate or sometimes narrowly oblong; midvein reddish brown in the dry state, whitish when fresh, smooth and glabrous, flat beneath, slightly grooved above; the 9 to 11 lateral pairs of nerves less evident, divaricate but tips ascendingly curved and faintly united, reticulations very fine and obscure; petiole slender, 1 cm. long, glabrous; bud bract thin, membranous, reddish brown when dry, glabrous, caudately acuminate, curved, 2.5 cm. long.

Receptacles solitary or in pairs from the leaf axils, suberect, 1.25 cm. long, obovoid, glabrous, gradually tapering from the base to the more or less irregularly ridged subtruncate apex, whitish toward the base and dark green toward the apex, sprinkled with minute white spots; umbilicus not pronounced, bordered by a circular rim, covered by short and broad bracts; peduncle green, less than 1 cm. in length, smooth, at the distal end or just beneath the receptacle provided with 3 very small glabrous

bracts; the inner scales strongly deflexed, spathulate, 2 mm. long, smooth as is also the inner side of the syconium; flowers male and gall only; male flowers few, concealed beneath the bracts, 3 mm. long, monandrous, glabrous; its pedicel wand-like, 2 mm. long, provided with 3 to 5 bracts, the upper 2 or 3 enclosing the anther prior to anthesis, oblanceolate, all brown and glabrous; anther 2-celled, upon a short stipe, the 2 cells widely separated, longitudinally dehiscent, 1 mm. across, emarginate at apex, bilobed at base, slightly broader than long; gall flowers evenly scattered over the balance of the syconium, 3 mm. long, upon 2 mm. long stipes, many remain undeveloped, subglobose or obovoid, smooth, brown, 1 mm. in diameter, ridged along one side, bearing a short lateral pistil on the opposite side; style very short, bearing a slightly oblique flattened darker brown stigma.

Type specimen 10786, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

It was discovered in dense forests of a steep fertile slope at 4500 feet of mount Calelan. My Bagobo companion called it "Kalat-tayia."

This species belongs in the alliance with *F. lucbanensis Elm.* and others, but most closely to a specimen marked *F. curranii Merr.* from the Benguet mountains. The stipules in ours are much slenderer, twigs lax not at all furfuraceous, peduncles shorter and with smaller fruits.

Ficus adamsii Elm. n. sp.

Lofty tree; stem terete, 1.5 m. thick, 25 m. high or higher, its main limbs arising from below the middle; branches numerously rebranched; wood coarsely grained, odorless and nearly tasteless, not hard yet quite brittle, whitish; bark 2.5 cm. thick, yellowish gray, covered with excrescences, that on the branchlets smooth or in the young state minutely pubescent, its hypodermis light yellow, otherwise brownish, with a thin or watery latex. Leaves descending, folded upon the upper semilucid surface, alternatingly arranged toward the tips of the twigs, much lighter green beneath, sunken, drying blackish brown, deciduous, leaving nearly circular scars, entire, subcoriaceous, gradually terminating into the slightly recurved acute to acuminate apex, below the middle gradually narrowed or cuneate, at the very base blunt, oblong

to broadly lanceolate to oblanceolate, the blades 15 cm. long, 5 cm. wide across the middle, frequently smaller; midvein prominent, nearly black when dry, also glabrous; lateral nerves 11 to 14 pairs, slightly ascending, much less prominent, straight and nearly parallel, the subbasal pair still less prominent and much ascending, tips united in high arches, reticulations obsolete; petiole subglabrous, 3 to 5 cm. long or even longer, with a minute groove on the upper side; bud bract caducous, 1 cm. long, rigid, nearly glabrous, sharply pointed.

Receptacles ascending, mostly in pairs of the leaf axils, 8 to 12 mm. long, subglobose, green, with yellowish lenticels, smooth, wrinkled in the dry state; umbilicus smooth, slightly in a ring shape, the inner bracts rather broad, transversely placed; peduncle less than 1 cm. long, puberulous, slightly thickened and without bracts toward the distal end but usually glandular or verrucose; flowers male and gall only; the male monandrous, scattered throughout the syconium, 2 mm. long; pedicels 1 mm. long, nearly as broad, smooth although somewhat angular; perianth splitting into 4 segments, quite rigid, dark brown, linear spatulate to lanceolate, arising from near the top of the stout pedicel; anther subsessile, 1.25 mm. long, quite broad and truncate at both ends, the rigid connection very dark brown; gall flowers more numerous, similarly spreading, sessile, the subtending perianth segments much more narrower and setaceously pointed, usually curved; its ovary ovoid, 1.25 mm. long, with age becoming ellipsoid; style terminal, as long as the ovary, of the same yellowish brown color, slightly thickened toward the base, terminally attached; stigma blackish brown, rather narrow, usually tipped.

Type specimen 11177, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

In dense woods of fertile soil along the Sibulan river at 2500 feet altitude. The Bagobos call it "Ocob." Named after the man who first recognized the utility of this genus.

Ficus multiramea Elm. n. sp.

A slender erect tree; stem 12 m. high, 3 dm. thick, its main branches from above the middle; branches numerously and

finely rebranched, the ultimate ones lax but not long; twigs suberect or rather ascendingly curved, the young portion scabrous; wood soft, light, pale white, without odor or taste, with prominent concentric rings; bark smooth, mottled with brown and grayish white. Leaves very numerous, chartaceous, equally rough on both sides but glabrous, slightly paler green beneath, ascending, nearly flat but with strongly recurved caudate tips and only shallowly conduplicate on the upper side, unequally sided and diverse in size, drying dull green especially the upper side, tips usually falcate, margins entire but with a tendency of curving upon the upper side while curing, lanceolately or oblanceolately oblong, larger blades 1 dm. long by 1.5 cm. wide across the middle, base obtuse or cuneate, gradually tapering toward the apex; midvein raised beneath, with short hispid hairs or rough tubercles; primary nerves 3 to 5 pairs, similar, the basal pair parallel with the margin, the upper ones ascendingly curved, their tips strongly united, articulations likewise very evident; petiole 3 to 5 mm. long, scaberulous; bud bract less than 5 mm. long, nearly smooth, very finely pointed.

Receptacles solitary or in pairs from the leaf axils, obscurely obovoid, 1 cm. long, at the base constricted into a peduncle-like stalk, slightly scabrous, green, with very minute whitish spots; umbilicus short conical, the aperture guarded by the inner bracts extending outward; peduncles green, 3 to 5 mm. long, provided toward the distal end with few very small bracts; inner umbilical scales white, oblongish, minutely ciliate on the edges, about 2 mm. long, inner surface of syconium white ciliate; flowers young, numerous, apparently all female, upon very short pedicels, 2 mm. long ,white except the ovule and stigma; perianth 5-segmented to the base, the linear segments arranged in a whorl beneath the pistil, 1.5 mm. long, provided with fine slender white hairs; ovary flattened, glabrous, obovoidly lenticular, 1 mm. across, edged with a subhyaline crest; style similar in color and equal in length, laterally arising, suberectly curved and sparingly ciliate toward the stigma which is but a small brown capitate point.

Type specimen 11651, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered in fertile humus covered soil of dense forests

at 4000 feet along the trail to Talon and near the Baruring river. My companion, a Bagobo, named it "Maramai."

Male flowers not known, therefore section not certain. Its leaves very strongly resemble *F. cumingii Miq.* but not that species.

Ficus todayensis Elm. n. sp.

An erect middle sized tree; stem 17 m. high and 5 dm. thick, branched above the middle; branches crookedly rebranched, spreading, the twigs numerous and slightly roughened; bark grayish white, blotched, yellowish beneath the epidermis, smooth except the young portion; wood coarsely grained, light, soft, white or paler, odorless and tasteless. Leaves copious, chartaceous, glabrous, alternatingly and widely scattered along the branchlets, similarly scabrous on both sides, lucid above, duller beneath, the slender acuminate tips recurved, otherwise horizontally spreading or descending, obtuse to subcuneate at the base, inequilateral, greatly varying in size and shape, the entire margins subrevolute at least in the dry state, the small ones subelliptic, the larger ones ovately oblong or merely oblongish, curing very dull green, the larger blades 12.5 cm. long, 4.5 cm. wide across the middle or a trifle below it, midvein also scabrous, with 4 to 6 lateral nerves on each of its sides, the lateral ones ascendingly curved, the basal pair strongly so, their tips obscurely united, cross bars and reticulations obsolete; petiole 1 cm. long, caniculate, scabrous; bud bract brown when dry, subglabrous, acutely pointed, not exceeding 5 mm. in length.

Receptacles solitary or in pairs, mostly from the leaf axils, globose or a trifle thicker above the middle, scabrid, more or less 1.5 cm. across, light lemon yellow, becoming smooth when fully ripe; umbilicus slightly raised, circular, relatively small, covered over by short thick scales except the aperture which is guarded by the inner bracts protruding outwardly, the innermost bracts acute to acuminate; flowers red, only fertile female of different stages, the large ones 4 mm. long, upon 2.5 mm. long pedicel; ovary closed over by a 5-segmented dark brown perianth; style slender, 1.5 mm. long, sublateral, bearing a slender clavate stigma; ovary straw brown or yellow, lenticular, 1 mm. across, hyaline ridged clear around, smooth, crustaceous.

Type specimens 10810 and 11129, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June and July respectively, 1909.

Quite large trees discovered on a very steep gorge near the Baruring river at 3000 feet. The Bagobo calls number 11129 "Ropit."

In the group with *F. asperrima Roxb.* and *F. ampelas Burm.*

Ficus nota (Blco.) Merr.

Field-note:—Tree, 30 feet high, with an 8 inches thick stem; stem crooked, branching from above the middle, forming an umbrella shaped crown; wood very soft, white, coarsely grained, odorless and tasteless; bark brown and obscurely checked, gray and smooth on the branches; leaves submembranous, flat, dull green on the upper side, paler beneath, the veins beneath yellowish green; figs upon slenderly branched and hanging tubercles, from the stem and larger branches, 1 inch across, green, brown lenticelled, nearly globose or obscurely obovoid, upon 1 inch long green and flexible peduncles.

Represented by number 10967, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

Collected in damp woods near the Baracatan creek at 1500 feet and at the upper limit of the cogon fields. "Basicong" is the native Bagobo name.

A widely distributed species at least as far as the Philippines are concerned. It is closely allied to *F. merrittii Merr.*, less closely to *F. satterthwaitei Elm.*

Ficus disticha Blm.

Field-note:—A numerously branched tree climber; stem 1.5 inch thick, round; branches tough, quite rigid, their ultimate ends suberect; old bark lenticelled and grayish brown, young portion smooth and scurfy brown, freely bleeding with latex; wood porous, sappy white, odorless and tasteless; leaves rigidly coriaceous, lucid dark green above, yellowish tessellate beneath, upon ascending petioles, the blades flat but gradually recurved; figs usually axillary or along the virgate twigs below the foliage or upon short leafless stalks, obovoid, 0.33 inch long.

Represented by number 10901, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

Sprawling over the tree tops of a wooded ridge at 4500 feet of mount Calelan. "Cabansal" is the Bagobo vernacular name.

Previously only known from southern Negros and the vicinity of mount Banahao. A very characteristic species.

Ficus arenata Elm. n. name. *F. hispida odorata Blco.* Fl. Filip. ed. I; 686. *F. odorata* (*Blco.*) *Merr.* in Gov't. Lab. Publ. XVII; 15, 1904—not *Ficus odorata* (*Urostigma odoratum Miq.*) Pl. Jungh. I, tab. XXIV; 48, 1853.

Field-note:—A rather crooked and spreading tree, 20 feet high, stem 1 foot thick; wood whitish and odorless, soft, tasteless except the juice; bark smoothish, whitish on the branches; leaves harsh or sandy on both sides, spreading and descending, dark green above, much lighter beneath, the conspicuous nerves whitish on the nether side; figs also harsh, solitary or in pairs from the leaf axils, green, soon becoming yellow and on the sun exposed side red, 0.75 inch thick, somewhat flattened.

Represented by number 10505, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

In forests on the north brink of the Baruring river gorge at 4000 feet altitude along the trail to Talon. The Bagobos call it "Pesan."

This is less hairy probably due to the shaded high altitude in which it was found. Usually it inhabits the hill forests and woods at much lower altitudes. Its range extends all over the Philippines and occasionally becomes semidomesticated. The leaves are extensively used by the natives for scouring and polishing purposes.

Ficus villosa Blm.

Field-note:—Scandent and forming tangled bushes; stems terete, grayish brown, covered with lenticels; the branches brown, tough and quite rigid, the twigs covered with bristle-like yellowish hairs; bark copiously bleeding with milky white and sticky sap; the inner wood porous, the heartwood reddish; leaves chartaceous, shining deep green above, somewhat yellowish

green beneath, recurvingly descending, otherwise flat; the brown dead stipules or bud bracts 1 inch long by 0.5 inch wide across the base; figs clustered from 1 to 5 in the leaf axils or along the branchlets, green, with minute milk spots, globose or more flattened at the apex, 0.5 inch in diameter, umbilicus sunken, suberect, arising from short bracteate tubercles.

Represented by number 10566, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

On a densely wooded or forested ridge south of mount Calelan at 4250 feet. "Cataupe" is the Bagobo name.

Ficus minahassae Miq.

Field-note:—A low tree; stem 20 feet high, 8 inches thick, branched from the middle; branchlets hispid, horizontally spreading and forming a roundish crown; twigs brown and with light colored lenticels, reddish on the inner side; bark smooth, when old gray; wood nearly white throughout, very soft and pulpy, without odor or taste; stipules subpersistent, brown, deflexed; leaves thinly chartaceous, horizontally spreading, the older ones descending, chiefly crowded at the ends of the ascendingly curved twigs, dull green above, yellowish so beneath, nearly flat; figs in 0.75 inch thick globular masses or balls, arranged along branched flexible descending or pendant ligneous tubercles which arise from the stem and lower branches and which often reach 10 feet in length.

Represented by number 10666, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

Collected in dark rich soil of slightly wooded open flats at 3000 feet. The Bagobo vernacular name is "Sangay."

Ficus satterthwaitei Elm.

Field-note:—Crooked and gnarly appearing tree, with stem 30 feet high and 1.5 foot thick; main branches arising from above the middle, spreading, forming an umbrella shaped crown; greenish twigs lax and mostly descending; leaves subcoriaceous, deep green above, much paler beneath, the young ones yellowish green, nearly flat with tips recurved and margins coarsely wavy, their veins similar in color as the young foliage; infrutescence

hanging upon 3 to 13 inches long tubercles along the stem and larger branches; tubercles flexible, branched; figs dull green, with small brown lenticels, subglobose excepting the elongated basal stalk, 1.5 to 2 inches in diameter, apex flat, with a sunken umbilicus, between the middle and the apex undulately marked with concentric ridges and bracts, peduncle proper 1.5 inch long.

Represented by number 10898, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

Scattered in light woods of moist fertile soil at 3000 feet altitude. "Basicong" is the native Bagobo name.

Ficus cuernosensis Elm.

Field-note:—A small tree; stem 5 inches thick, 15 feet high, branched from above the middle; branches laxly spreading, twigs suberect; wood very soft, sappy white, odorless and tasteless; bark brown, smooth, mottled on the branches; leaves subchartaceous, descending, spreading, shallowly conduplicate on the upper darker green surface, tips abruptly recurved; figs subglobose, fully 0.5 inch thick, green and provided with minute brown lenticels which are surrounded by yellowish zones, mostly few clustered in the leaf axils; flowers red.

Represented by number 10717, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

In damp fertile soil of dense forests at 3500 feet altitude, north of the Baruring river along the trail to Talon. The vernacular or Bagobo name is "Basicong."

Its leaves are similar to *F. cuernosensis Elm.* but its infrutescence not quite so typical.

Ficus cassidyana Elm.

Field-note:—A shrub-like tree; stem 16 feet high or less, solitary or 2 or 3 from the base, branched from below the middle, 3 to 5 inches thick; wood soft, pale white, light, odorless, with a slight sweet taste; bark smooth or only thinly checked, yellowish and more or less mottled with gray blotches; limbs slender, divaricately spreading, only sparingly rebranched, the rather slender ultimate ones curvingly erect; leaves membranous,

nearly horizontally spreading, the larger ones 1.5 feet longer and 1 foot wide, pale or yellowish green especially so along the nerves beneath; infrutescence upon branches, densely bracteate, 6 inches long, flexible, tubercles along the stem; peduncles 1 to 2 inches long, terete, green; figs flatly obovoid, 3 inches across, very dark green, covered with grayish brown hairs and minute light brown colored lenticels.

Represented by number 11225, *Elmer*, Todaya (Mt. Apo), Mindanao, July, 1909.

In woods mixed with bamboo tree clumps on a sharp ridge leading to mount Burebid at 2750 feet. Called by the Bagobos "Basicong."

Besides my type from Leyte it is not known. Several plants were noticed along this same ridge and later in the season figs were seen 4 to 5 inches across.

Ficus sibulanensis Elm. n. sp.

A large tree; trunk 20 m. high, 1.25 m. thick, terete; main branches arising from the middle, ascending, ultimately numerously branched; wood odorless and tasteless, quite soft and light, sappy white, with conspicuous concentric rings; bark quite smooth, grayish white mottled, brown on the slender flexible twigs; young portion of twigs covered with yellowish brown oppressed hairs but soon becoming glabrous and dull brown. Leaves alternatingly scattered along the branchlets, coriaceous, horizontal or descending, deep green, shallowly conduplicate, glabrous and sublucid on the upper surface, much lighter green and soft pubescent on the nether side, entire, elliptic, apex bluntly obtuse, base roundly obtuse to subcuneate, the normal blades 17.5 cm. long and nearly 10 cm. wide across the middle or a trifle above it but frequently much smaller; midvein very conspicuous beneath, the 7 to 9 divaricate lateral pairs anastomosingly interarching at their ends, the subbasal pair ascending and parallel to the margin, the secondary nerves evident but reticulations obscure, all densely covered with short soft hairs; petiole, 1.5 cm. long, at first densely canescent but soon becoming glabrate, deeply grooved along the upper side, when old russet scurfy brown; bracts 3 cm. long, slenderly acuminate, densely canescent.

Receptacles mainly solitary in the leaf axils, green, rather smooth, in the young state, covered with a soft pulverulence, globose, 2 cm. in diameter, upon short recurved ebracteate peduncles; syconium thick and hard; umbilicus small, imbricately covered by short flat scales, the inner ones linear and extending centrally; flowers dense, apparently neutral and gall only, of different ages, the old ones dark brown and 4 mm. long; pedicel conspicuous, wavy, much shorter in the younger ones, at least 2 mm. long; the younger perianth much longer, 3 to 5-segmented, of unequal sizes, split down to below the middle, the segments linear to lanceolate and with slender apices, the sides lighter brown; gall ovary straw colored, egg shaped or ellipsoid, 1.25 mm. long; style brown, lateral, 2 to 5 mm. long, slender, bearing a slightly expanded and somewhat oblique stigma.

Type specimen 11154, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

In moist soil mixed with sand and gravel of a densely forested flat in a deep gorge along a streamlet near the Sibulan river at 1750 feet. "Dapasan" is the vernacular Bagobo name.

There is little doubt of our species being related to ***F. bataanensis*** *Merr.* and *F. crassitora Elm.*

Ficus peabodyi Elm. n. sp.

A rather large tree; stem 6 dm. through, 15 m. high; branches ultimately widely spreading and crooked, the young portion of the twigs smooth; bark grayish brown mottled, lenticelled at the ends of the branchlets. Leaves rather thin, shining and darker green on the upper surface, flat, only the obtuse to acute apex slightly recurved, glabrous, both sides turning similarly brown when dry, variable in size, entire toward the truncately rounded or broadly obtuse bases, otherwise crenately dentate, the larger blades 15 cm. long by one half as wide across the middle, elliptically oblong in shape, alternatingly arranged toward the ends of the branchlets; midvein conspicuous beneath, with 7 to 9 also prominent ascendingly curved lateral pairs, the cross bars obscure, all nerves slightly strigose in the young state; petiole 1.5 cm. long, subglabrate; bud bracts acuminate, subglabrous, 1.5 cm. long, brownish.

Receptacles hanging upon rather flexible and numerously

rebranched woody tubercles along the larger branches only; tubercles 15 to 30 or 50 cm. long, conspicuously scarred or ringed; figs greenish, turning yellowish with maturity, less than 2.5 cm. across, flattish obovoid, usually horny about the upper flattened ends with bract-like protuberances, numerously spotted with minute brown lenticels which are surrounded by yellow zones; peduncle glabrous, green, averaging 1 cm. in length, gradually thickened toward the distal end; bracts few to several, scattered chiefly above the middle, thick and blunt, of the same color; umbilicus hard, green, flat, covered over horizontally by thick scales, frequently arranged in a 5-starred fashion, the inner ones thinner, dark brown, transversely overlapping; flowers apparently only fertile female, of different stages, 3 mm. long, upon 1 mm. long pedicels, dark brown or nearly black, glabrous; ovary obliquely oblong or obovoid, 1.5 mm. long; perianth one half as long, gamophyllous, subtending the ovary, persistent; style 1.5 mm. long, slender, subterminal, of the same dark brown color; stigma expanded, rugose or obscurely lobed, much lighter in color, in the early state confluent.

Type specimen 10494, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered in good soil of the densely humid and heavily forested mount Apo basin at 4000 feet. "Basikan" is the native or Bagobo name.

It has a close affinity to *F. satterthwaitei Elm.* and *F. nota (Blco.) Merr.*, and with them they form a natural alliance with several other *Covellia* species.

Ficus sordidissima Elm. n. sp.

Small tree, with a 15 cm. thick and 7 m. high stem; wood very soft, whitish, without odor or taste; bark smooth, grayish brown on the stem; branches arising from above the middle, divaricately spreading, rebranched, the ultimate ones rather slender and numerous, flexible, somewhat drooping, their ends suberect and short dirty brown pubescent. Leaves submembranous, horizontally spreading, flat, dark green above, much lighter green beneath, well sordid on both sides in the dry state, blackish on the upper and greenish on the lower surfaces, alternate, glabrate, very unequal in size, distinctly oblong but

usually a trifle wider just above the middle, entire, the normal blades 17.5 cm. long by 7.5 cm. wide across the widest portion, glabrous, slightly roughened on both sides, gradually tapering into the acute point, occasionally a trifle inequilateral at the rounded slightly cordate bases; midvein prominently raised on the nether side, sordid brown and slightly hispidulous; nerves 5 to 7 on a side, ascending, also prominent, tips anastomosing, cross bars and reticulations quite evident from beneath; petiole 1 to 1.5 cm. long, short hispid pubescent, brown in the dry state; bud bracts 1 cm. long, acuminate, strigosely brown pubescent especially on the dorsal median line.

Receptacles obovoidly globose, densely clustered upon 15 cm. long branched tubercles along the stem, the exposed portions green, otherwise pale white, sprinkled with brown colored lenticels, 2 cm. long; peduncle at most 5 mm. long, with minute or obsolete bracts; umbilicus small, only slightly raised, the outer scales transverse, the inner ones subpendulous; flowers male and gall only; male flowers confined to the region below the umbilicus, old yet persistent, 2.5 mm. long, upon thick 1 mm. long pedicels, monandrous, subtended by an oblique gamophyllous one half as long perianth; anther 1.5 mm. long, broadly oblong, subsessile, usually bearing a short mucronate point; young gall flowers upon long light brown pedicels, compressed, obliquely obovoid; the mature ones appear as if sessile, scattered and intermixed with the younger ones, blackish brown, 1.5 mm. long; style 1 mm. long, subterminal, bearing an equally dark brown oblique and gobulose stigma; perianth mostly obsolete.

Type specimen 11218, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Discovered on the banks of the Mainit creek in a very humid densely forested depression near the Sibulan river at 3750 feet. Named with pleasure after *Mr. H. Peabody*, a successful planter of the Davao gulf region. The Bagobos know it as "Basicong."

Probably its greatest affinity is with *F. endothrix Warb.* from Dagatpan, collected by him in mixed forests on a plain, but our fruits are without yellow hairs on the inner side of the syconium and leaves not "ellipticis" nor acute at both ends.

Ficus variegata Blm.

Field-note:—A large 60 feet high tree; trunk not straight, subterete, 3 feet thick, buttressed; limbs widely spreading, forming an umbrella shaped crown; wood quite soft and fibrous, whitish on the outside, reddish toward the center, odorless and tasteless; bark brown, lenticelled, thick, flowing with latex when cut; leaves spreading, nearly flat, lucid dark green on the upper side, much paler beneath, coriaceous, veins yellowish green; infrutescence upon 1 to 5 inches long thick rigid woody and only sparingly branched tubercles; figs hard, smooth, obovoid, 2 inches thick, green with reddish streaks especially toward the sunken apex; peduncles green, pendulous, 3 inches long, at the distal end crowned with a ring of obscure bracts.

Represented by number 10707, *Elmer*, Todaya (Mt. Apo), Mindanao, May, 1909.

Collected in woods at 3500 feet on the trail following the Baruring river toward Talon. The native or Bagobo name is "Basigong."

Ficus latsoni Elm.

Field-note:—Tree, rather of a large size; stem more or less crooked, branched mainly toward the top, round, 2 feet thick, 50 feet high, buttressed at the base; wood soft, light, pale white and with reddish streaks, odorless and tasteless; bark densely lenticelled, otherwise smoothish, of a characteristic cinnamon brown; branches crookedly rebranched, the main ones widely separating, reddish brown, the twigs suberect; leaves coriaceous, ascendingly spreading, dark green on the upper conduplicate side, much paler beneath, the main veins yellowish or rather whitish green; figs clustered and hanging from short unbranched tubercles along the larger as a well as along the smaller branches, obovoid, apex deeply sunken, smooth, green, less than 0.5 inch in diameter, upon dark green and pendant peduncles.

Represented by number 10991, *Elmer*, Todaya (Mt. Apo), Mindanao, June, 1909.

Gathered from steep wooded slopes of the Baracatan creek at 1500 feet. The natives or Bagobos call it "Banacol."

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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EUPHORBIACEAE COLLECTED ON PALAWAN ISLAND

By

A. D. E. Elmer

ANTIDESMA Linn.

Antidesma leptocladum Muell. Arg.

Field-note:—Shrub; stem few inches thick, 9 feet high, branched from near the base; wood hard, heavy, finely grained, nearly atropurpureus except the sappy white outer portion, odorless and tasteless; bark light castaneus, more or less checked and scaling in small thin plates; branches few but widely spreading, the slenderer ones somewhat drooping; leaves chartaceous, lucid dark green on both sides, tips recurved, otherwise flat; fruiting spikes dark green, the berries dark vinosus, juicy and sour in the ripe state.

Represented by number 12808, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In shallow earth mixed with stones on the wooded Iwahig river bank at 500 feet altitude.

Antidesma ghaesembilla Gaertn.

Field-note:—Burly tree; stem 8 inches thick, 20 feet high, branched from below the middle, crooked and not terete; branches likewise crooked; twigs short, greenish, suberect; wood sappy

white, odorless and tasteless, rather heavy, moderately hard; bark gray, thick, pinkish beneath the shredded epidermis; leaves horizontal, thinly coriaceous, a trifle paler green beneath, shining and usually curved upon the upper side; inflorescence profuse, suberect and divaricately spreading; the stalks pale yellowish green or greenish white, the flowers yellow except the pale to dark red anthers, a little fragrant.

Represented by number 12703, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Scattered about in the cogon and fine stemmed bamboo formation at 50 feet altitude. The Tagbanua call it "Anyam." A characteristic tree species of the dry well drained soil of the cogon fields while in soggy or adobe soil of low places in this same region *Nauclea media Hav.* takes its place.

Antidesma subolivaceum Elm. n. sp.

Slender erect shrub; stem 3 to 5 cm. thick, 3 to 4 m. high, terete, crooked, branched from the middle; branches divaricate, few, sparingly rebranched, very slender; wood testaceus, rather hard and heavy, odorless and without taste; bark thin, of the same color, greenish or yellowish gray on the smooth outer surface, the young twigs olivaceous pubescent. Leaves alternatingly scattered along the branchlets, horizontal or descending, submembranous, flat except the recurved acuminate point, sublucid on both sides, paler green on the softly olivaceous green pubescent lower side, glabrous above, turning brown while drying, entire, the average blade 15 cm. long by 5 cm. wide across the middle, oblong, the base rounded or obtusely rounded; midvein raised beneath, olivaceous hairy even in the groove upon the upper side; lateral nerves 7 to 9 on a side, very oblique, curved especially toward their tips, scarcely united, reticulation very obscure; petioles 5 mm. long, stout, similarly hairy; stipules linearly setaceous, 1.25 cm. long, also pubescent, one from each of the petiole, caducous. Infrutescences recurved, spicate, 1 to 2 dm. long, fruit bearing mainly above the middle, axillary; rachis flexible, terete, green, finely brown pubescent; bracts mostly toward the base, similarly pubescent but only one half as long as the stipules; drupes descending, compressed, obliquely ovoid from the side view, rugose, becoming nearly

glabrate and red on the exposed side, less than 1 cm. long, sessile, when young densely olivaceous pubescent; the 3 stigmas sessile, widely spreading, brown, slenderly forked; perianth segments subpersistent, similarly pubescent.

Type specimen 12883, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In moist fertile soil of humid forests at 750 feet along the trail to Napsan on the west coast of Palawan.

Closely related to *A. cumingii Muell. Arg.* and *A. membranifolia Elm.*

ACTEPHILA Blm.

Actephila dispersa (Elm.) Merr.

Field-note:—Erect shrub; stem straight, 1 to 3 inches thick, 9 feet high or less, branched from the middle; bark grayish, with a green hypodermis, otherwise whitish, smooth, slightly checked when old; wood moderately soft, dirty white, odorless and tasteless; main branches few and toward the top only, spreading, the twigs suberect; leaves horizontal, coriaceous, paler green beneath, flat, tips slightly recurved; fruits clustered from the leaf axils, hanging upon dark green 1.25 inch long pedicels which gradually thicken toward the distal end; calyx dark green; capsule of the same color, flatly globose, 0.75 inch across, 3-celled, 6-seeded.

Represented by number 12621, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Scattered in fertile moist soil of densely wooded flats at 25 feet altitude. "Lambonau" is the Tagbanua name.

ALCHORNEA Sw.

Alchornea rugosa Muell. Arg.

Field-note:—A shrub; stem 2 to 5 inches thick, 15 feet high, branched from below the middle; branches crookedly rebranched and widely spreading; wood rather hard, whitish

especially on the outside, without odor or taste; bark brown and gray, reddish from the hypodermis clear to the wood; leaves horizontal, ascending from the petiole, thinly chartaceous, twistingly recurved, tips abruptly so, dark green above, much paler beneath, diverse in size; inflorescence erect, terminal or from the uppermost leaf axils, all the stalks green; buds reddish, flowers yellow and odorless.

Represented by number 12623, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Very common along the south eastern coast. Either in rich moist soil of dense forests near the coast or in gravelly or otherwise poor soil of shruberries bordering grassy glens. "Limo" is the Tagbanua name.

Alchornea arborea Elm. n. sp.

A middle sized tree; stem straight, terete, 3 dm. thick, 12 m. high, its main branches arising from above the middle; wood moderately hard and brittle, dingy yellowish white throughout, without odor or taste; bark smooth, grayish white on the inner side; branches crookedly rebranched, the short rather stiff twigs suberect, forming a rather dense crown, the young apical portion yellowish green puberulent, the branchlets lenticelled. Leaves alternating, descending, subchartaceous, strongly recurved toward the acute tip, folded upon the upper very dark green and lucid surface, much paler green beneath, glabrous, drying yellowish brown, the rounded or bluntly obtuse base entire, otherwise coarsely and sinuously serrate, the average blades 15 cm. long by 6 cm. wide across the middle or slightly above it; midvein conspicuous beneath, nearly glabrous; lateral nerves 7 or 8 pairs, also prominent, much ascending, their tips branched and more or less united, cross bars and reticulations quite bold from both sides; petiole 3 cm. long, terete, thickened at both ends, subglabrous. Inflorescence nearly odorless, erect and terminal, 1 to 2 dm. long, paniculately branched from near the base, all the stalks dark green and subtended by bracts, finely velvety which in the dry state turns olivaceous; flowers deciduous, sessile or upon very short pedicels, articulate, subtended by a single bract; these are about 1.5 mm. long, acutely pointed or the smaller ones merely rounded, ovate in outline, minutely pubescent on

the back and especially along the margins; calyx subglobose in the bud state, glabrate; segments prasineus, concave on the upper side, divided to the middle into 4 equal parts, 2 mm. long, the obtusely rounded tips inwardly curved, elliptically oblong; stamens 8, grouped about a sterile pistil; filaments 0.5 mm. long, glabrous; anther deep yellow, about as long, broadly elliptic or oval, ends emarginate, dorsifixed, longitudinally and laterally dehiscent; short style thick as is also the stigma, somewhat hairy; young fruit green but covered with fine cinereous hairs which in the dry state turns fulvus, obovoidly elongated, obscurely 3 or 4-angled, not hard, 1 cm. long, bearing brown bilobed and recurved sessile stigmas, 3 or 4-celled, usually only 1-seeded and pendant.

Type specimens 12884 in flower and 13067 in young fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April, 1911.

This tree is not rare in fertile soil of the humid forests at 750 feet altitude and along the trail to Napsan on the west coast of Palawan.

ACALYPHA Linn.

Acalypha stipulacea Klotz.

Field-note:—A slender erect tree; stem terete, 3 inches thick, 15 feet high, the main branches arising from the middle; wood soft, dingy white, odorless, a trifle sour; bark brown, with few gray blotches, smooth, with numerous fine grayish white lenticels, green except the epidermis, easily stripping; branchlets slender but not numerous, forming a flattish crown, brown except the suberect green twigs; leaves ample, mostly horizontal, submembranous, recurved especially toward the apex, much paler beneath; spikes pale green, ascending but recurved toward the ends; the pistil greenish white, turning reddish when old; young fruits green, distincly trigonous.

Represented by number 12655, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Inhabits fertile humus covered soil of dense woods at sea level. The Tagbanuas call it "Balingod."

AGROSTISTACHYS Dalz.

Agrostistachys maesoana Vid.

Field-note for 13044:—Suberect shrub; stem gnarly, the upper portion conspicuously so, 3 inches thick, 15 feet high or long, crooked, branched toward the top; wood moderately hard and brittle, without odor or taste, the thin sapwood white, otherwise melleus; bark smooth, greenish gray mottled, the middle region similarly yellow; main branches mostly horizontally spreading, crooked, repeatedly branched; twigs quite slender and flexible, crooked and curved, descending, with suberect tips; leaves chartaceous, shining on the upper flat side, slightly paler beneath, ascending and toward the apex clustered, subtended by yellowish green bracts, odorless, caducous, male only, the recurved pedicels with the calyx dingy white, the central organ purer white.

Represented by numbers 13044 and 12851, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April respectively, 1911.

This peculiar plant is rather common in our region, confined however as an undershrub in moist deep fertile soil of humid woods or forests at 250 feet altitude.

BACCAUREA Lour.

Baccaurea odoratissima Elm. n. sp.

Slender erect shrub or tree-like; stem 1 dm. thick, 7 m. high, frequently smaller, subterete, crooked, branched from the middle or below it; wood moderately hard, melleus, odorless and without any taste; bark relatively thin, avellaneus, minutely and thinly checked; branches divaricate, numerously rebranched, the branchlets suberect, subverticellately rebranched. Leaves thinly coriaceous, horizontally spreading, recurved especially toward the blunt quite abrupt acute apex, glabrous, much paler green beneath, margins entire, the average blades 1 dm. long by one half as wide across the middle or above it, oblong or a trifle wider in the upper portion, drying dull green, the small blades lanceolate, base usually obtuse; midvein glabrous, brown

in the dry state, prominent beneath, very plain on the upper side; lateral nerves about 7 pairs, ascendingly curved, similar in color, tips strongly arching, reticulations and cross bars relatively obscure; petiole varying from 1 to 3 cm. long, strict, shining brown when dry; bud bracts acuminate, caducous, hairy when young. Inflorescence solitary or usually in small clusters from the branches and even the stem, with a strong molasses-like odor; spikes pendant, pale green, subglabrous; flowers irregularly scattered in small fascicles from below the middle toward the apex, citrinus; pedicels pale yellow, 1 mm. long, glabrate; perianth 4, thick, 1.5 mm. long, elliptic, tips incurved, tapering toward the base, united into a short stalk; stamens 5, surrounding a sterile ovary disk, glabrous, the filaments very short; anther of 2 pill-like sacs, 0.75 mm. wide, 0.33 mm. long, basifixed, emarginate at apex, auriculately lobed at the base, laterally dehiscent; fruiting spike glabrous, 1 to 2 dm. long, brick red, in hanging fascicles; drupes subatropurpureus, sour, soft, 7.5 mm. thick, with 2 juicy deep pink seeds, glabrous, short ellipsoid or ovoidly so, usually somewhat pendant, glabrous and lucid when mature.

Type specimens 12864 for flowers and 13160 for fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and May respectively, 1911.

This beautiful species was discovered in fertile moist humus covered soil of dense forests at 750 feet along the trail to Napsan leading to the west coast of Palawan. Quite common here but nowhere else seen.

Baccaurea terminalifolia Elm. n. sp.

Erect shrub, 3 m. high or higher; stem 1 dm. thick, subterete, mainly branched from the middle; wood moderately hard and heavy, dull sappy white, odorless and tasteless; bark grayish brown, finely checked; branchlets slender, laxly rebranched, the twigs suberect and in subwhorls, roughened by the old leaf scars, the young portions glabrous. Leaves radially and horizontally spreading, flat, chartaceous, much paler green beneath, crowded toward the ends of the branchlets, submembranous, drying dull green, glabrous, entire margins minutely involute in the dry state, apex obtuse or abruptly acute, subcuneate at

base, the larger blades obovately oblong, 1.5 dm. long by 6 cm. wide above the middle, the smaller blades oblongish; midvein yellowish brown, smooth, prominently raised beneath, also quite evident from the upper side; lateral nerves 5 to 7 on each side, very oblique, tips curved, cross bars and reticulations very faint; petiole glabrous, strict, from 1 to 3 cm. long, thickened at both ends; bud bracts 7.5 mm. long, brown, sharply acute, hairy along the dorsal median line. Inflorescence spicate, clustered from the axils of the lower leaves or from beneath the foliage, 3 to 8 cm. long, descendingly curved, the rachis greenish white and puberulent, flower bearing from below the middle to apex; flowers cremeus or sulphureus, odorless, usually few clustered upon a short common stalk which are at the base subtended by small bracteoles, pedicels also very short, all finely puberulent; perianth glabrous, globose in the bud state; segments 4, thick, oblong to elliptic, 2.5 mm. long, tips incurved, united at the base into a 1 to 2 mm. long pedicel or stalk; stamens 5, circled about a sterile ovary; filaments very short, glabrous; anthers composed of 2 pill-like sacs, at least 0.5 mm. wide, only 0.25 mm. high, laterally dehiscent, basifixed, auriculately lobed at the base, emarginate at apex; infrutescence pendant upon reddish 1 dm. long spikes; drupes juicy, ovoidly globose, 7.5 to 1.25 mm. long, green except the reddish brown exposed sides, 2-ovulate but usually only 1 maturing, shining, bearing the subsessile brown stigma, upon 3 mm. long slender pedicels; seed surrounded by a deep lilacinus membrane, ovoidly compressed, attached at the apex.

Type specimens 12704 for flower and 13089 for fruit, *A. D. E. Elmer*, the former from Brooks Point (Addison Peak), the latter from Puerto Princesa (Mt. Pulgar), Palawan, February and April respectively, 1911.

Both plants were discovered in moist slightly sandy earth of wooded stream banks at about 500 feet altitude. Rare and called "Girangan" by the natives or Tagbanuas at Brooks Point.

CYCLOSTEMON Blm.

Cyclostemon iwahigensis Elm. n. sp.

A slender erect tree; stem 1.5 dm. thick, 8 m. high, sub-

terete, its main branches from the middle; wood moderately hard and heavy, yellowish especially the central mass, odorless and without taste; bark grayish white mottled, roughened with lenticels or excrescences on the stem; branches divaricately spreading, freely rebranched, smooth, the ultimate glabrous ones slender yet quite rigid. Leaves alternatingly scattered along the branchlets, chartaceous, glabrous, curing dull green, ascending or horizontal, the acute to acuminate tips recurved, otherwise nearly flat, when fresh a trifle paler green beneath, margins entire, base bluntly obtuse or rounded, the average blades 15 c m. long by 5 cm. wide a trifle below the middle, ovately oblong or the smaller ones broadly lanceolate, glabrous; midvein conspicuous beneath, yellowish brown, the 5 to 7 lateral pairs oblique and tips ascendingly curved, reticulations rather fine and more evident from the upper side in the dry state; petiole 1.5 cm. long, thickened at the distal end, glabrous, yellowish or dull purplish; bud bracts small, pubescent. Inflorescence axillary, glabrous, upon a short thick bracteated sparingly branched 5 mm. long common stalk or peduncle; pedicels strict, 1 to 1.5 cm. long, very slender, also glabrous, subtended by finely hairy bracteoles, articulate at the base, slightly enlarged toward the distal end; buds globose; calyx yellowish green, glabrate, elliptic, 7.5 mm. long, 5 mm. wide across the middle, more or less united at the base; the inner series of perianth cyathiform, nearly 1 cm. across, irregularly divided into 4 or 5 very broad lobes, the basal one third united to the lower series, woolly pubescent especially on the upper side, the marginal one third subhyaline, 2-ply on the upper side the ends of which are toothed, free and inflexed; stamens 20, spreading; filaments 5 mm. long, dingy yellow, soft in texture and woolly hairy; anthers yellow, less than 2 mm. long, sagittate but connected by the expanded distal portion of the filaments, obtuse at apex, glabrous, laterally dehiscent, ovary or young fruits pale green, wrinkled and cinereous pubescent in the dry state, ovoidly ellipsoid, 3 mm. long, 2 mm. across, apparently 2-celled and 4-seeded; stigmas 2, sessile, subpersistent, dry, divaricately spreading, hard, brown, thick, glabrous, plaited, 1.5 mm. long, occasionally slightly forked at the apex; ovules pendant from the central placentae.

Type specimens 13175 for flower and 12696 for young fruit, *A. D. E. Elmer*, the former from Puerto Princesa (Mt. Pulgar),

the latter from Brooks Point (Addison Peak), Palawan, May and February respectively, 1911.

The first number cited was collected in fertile forests at 250 feet altitude and the Brooks Point specimen in sandy soil of woods skirting the coast. The Tagbanuas or natives of southern Palawan call it "Magluny."

Apparently it differs from other *Cyclostemon* species known to me and whether or not the two numbers represent but one species of different sexes I do not know.

CROTON Linn.

Croton leiophyllus Muell. Arg.

Field-note:—Small tree; stem 8 inches thick and 25 feet high; branches above the middle, quite numerous and forming a dense crown; wood light and white, odorless and tasteless; bark yellowish or grayish white, brown beneath the epidermis; branchlets ascending, relatively short; leaves pendant or horizontal, tips recurved and conduplicate on the upper side, a trifle paler green beneath, coriaceous; spikes angularly striate, green, ascending and gracefully recurved; buds and flowers pistillate, odorless, green.

Represented by number 12725, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Scattered throughout the thin woods upon shallow red soil with a stony subsoil at 250 feet altitude.

Croton argyratus Blm.

Field-note:—Quite slender trees, with widely spreading crowns; stem crooked, terete, 5 inches thick, 20 feet high, branched above the middle; wood yellowish white, soft, light, odorless, slightly acrid; bark gray, covered with rough excrescences, badius except the epidermis; main branches slender, ascending and spreading, the ultimate ones lax and relatively short; leaves horizontally spreading, chartaceous, deep green on the upper shallowly folded surface, avellaneus beneath, tips recurved, the petiole and veins covered with cupreus scales or

hairs; inflorescence erect, terminal, occasionally branched from near the base, of the same color, pedicels and calyx yellowish green; stamens sulphur yellow.

Represented by number 12872, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Chiefly inhabiting rich humus covered soil of dense forests at 750 feet along the trail to Napsan. Its leaves are rather ornamental and no doubt it could be trimmed to a fine appearing shrub.

Croton (n. sp. in ms. by *E. D. Merrill*).

Field-note:—A small erect tree; stem 8 inches thick, 25 feet high, with its main branches from near the middle; branches at the top, numerously rebranched and forming an umbrella shaped crown; the twigs easily breaking and erect or suberect, occasionally subverticellately branched; wood quite soft, odorless and without taste, dingy yellowish white especially toward the center; bark smooth, gray and brown blotched, testaceus except the epidermis; blades ascending, flat, coriaceous, deep sublucid green above, much lighter beneath; inflorescence erect, the green more or less angular rachis descendingly arched toward the ends; calyx and bracts green; stamen and pistil pale green or yellowish so, the anthers more yellow; flowers slightly fragrant, the stigma turning brown with age.

Represented by number 12788, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in dry well drained soil of a thinly wooded flat at 250 feet altitude.

Distinguished chiefly from *C. ardisioides Hook.* by the shortter petioles, thicker leaves which are without the button shaped glands on the upper side of the basal end of the blade. The flowers seem also somewhat different, especially the staminate ones.

Croton cuprea Elm. n. sp.

Shrubby; stem 1 dm. thick, gnarly, 3 to 5 m. high, branched from below the middle; wood slightly odorous, tasteless, rather hard, yellowish on the outside, abruptly changing to a nearly

black heartwood; bark thick, brown except the smooth gray epidermis; branches widely spreading, laxly rebranched, the young twigs at first cupreus scurfy. Leaves few, at the ends of the short crooked twigs, subchartaceous, horizontally spreading, flat and recurved toward the gradually acute to acuminate points, whitish beneath but covered with minute copper colored scales, dull dark green above, drying greenish, exceedingly variable in size, ovately or occasionally broadly lanceolate, oblong, base usually rounded, entire, the larger blades 1 dm. long, 4 cm. wide a trifle below the middle; midvein very prominent beneath, cupreus lepidote, grooved above; lateral nerves 3 to 5 on a side, ascendingly curved, tips gradually reduced, becoming obsolete, reticulations visible from the upper side; petiole varying from 1 to 3 cm. long, grooved along the upper side, cupreus scaly; bud bracts numerous, 5 mm. long, acuminate, thick, also cupreus scurfy. Male spike axillary, nearly 2 cm. long, the stout pedicels subtended by bract vestiges, all densely covered with copper colored scales; female flowers usually solitary at the end of the 0.75 to 1.5 cm. long rather stout stalks which as in the male spike is subtended by a whorl of similar or bud-like bracts; ovary brown, scale covered; stigmas 3, brown, not scaly, sessile, recurved, forked; buds of male globose; pedicels short and thick, subtended by a rigid bract; perianth of a double series; the outer series thickly scurfy on the outside, the margins composed of hyaline scales, 3 mm. long, united below the middle, parting into 5 segments, with obtuse apices; the inner series of 5 nearly free segments much thinner, 2 mm. long, oblong, with broad hyaline and slightly fimbriate margins, pubescent toward the base especially on the upper side; stamens at least 10, clustered from the middle; filaments 3 mm. long, soft white pubescent about their bases, otherwise glabrous, yellowish green, when dry reddish brown; anthers yellow, oval or broadly elliptic, nearly 1 mm. long, fully as wide, basifixed, the granular connective broad and flattened, anther dehiscing along the edges; fruits flattish globose, nearly 1 cm. across, similarly lepidote, 3-celled and 3-seeded.

Type specimen 13236, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in seepage rock crevices on very steep only slightly wooded mountain flanks along the Iwahig river at 1000 feet.

Very near to *C. cumingii Muell. Arg.* but not to be confused with that species.

CODIAEUM Rumph.

Codiaeum palawanense Elm. n. sp.

A suberect shrub; stem 5 cm. thick, 3 to 4 m. high; branches very sparse, mainly at the top. Leaves not numerous yet crowded toward the ends of the branches or stem, alternate, rotately spreading, subchartaceous, glabrous, dark velvety green above, much paler or yellowish so beneath when dry, entire, oblongish to oblanceolate, terminated by an obtuse point, base rather broadly obtuse and abruptly constricted, average blades 4.5 dm. long, 1 dm. wide above the middle, gradually tapering toward the more suddenly constricted base; midvein brownish, ridged, very stout toward the base; lateral pairs 13 to 15, almost divaricate, slightly ascendingly curved, usually forked or few branched above the middle on the lower side, scarcely united, cross bars and reticulations very coarse and faint, all the veins equally visible from the upper side and bordered by pale yellow regions; petiole ascending, glabrous, terete or flattish on the upper side, 6 cm. thick, 5 cm. long, leaving large scars after falling, usually provided below or from the side by a foliaceous sessile bract 2.5 cm. long and obovate in shape. Spike terminal, erect, terete, greenish, striate, 5 to 8 dm. long, 6 mm. thick at the base, gradually reduced in thickness, glabrous, the basal one third sterile, also subtended by similar foliaceous bracts; flowers clustered and irregularly scattered; pedicels 5 mm. long, strict, puberulent, usually subtended by one or more minute bracteoles which are also puberulent and arising from irregular excrescences or finely cinereous lenticels; buds nearly globose; perianth segments 5, nearly free, imbricate, glabrous, ovately rotund, 5 mm. long, the inner ones a trifle smaller and thinner; stamens indefinite, centrally clustered; filaments subequal, glabrous, 1 to 2 mm. long, anthers basifixed, 0.5 to 0.75 mm. long, broadly oblong, shallowly emarginate at apex, the 2 cells widely separating toward the base, longitudinally dehiscent; mature capsule flattish, 7.5 mm. high, 1 cm. across, smooth, trigonous, 3-celled, 3-seeded, bearing 3 distinct sub-

sessile stigmas, septicidally dehiscing from the base, then loculicidally from the apex; seeds plump, ellipsoid, 6 mm. long, yellowish white, minutely sprinkled with brown.

Type specimen 13196, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered in reddish compact soil of a moist forested ridge at 2500 feet. Rare!

Nearest to *C. luzonicum Merr.* but sufficiently distinct in a number of characters. *Dr. Foxworthy's* collection 599 of the Bureau of Science series and *L. Mangubat's* number 492 from Balabac are cospecific.

CLEISTANTHUS Hook.

Cleistanthus pseudocanescens Elm.

Field-note for 13053:—A rather small tree; stem 6 inches thick, terete, 3 feet from the base, 20 feet high or higher; its main branches arising from the middle, usually widely spreading, ultimately numerously rebranched; wood odorless and tasteless, gradually changing from the thin whitish outside to the greater latericius central mass, quite hard; bark castaneus except the lenticelled roughened and blotched outer side; leaves descending, curved upon the upper smooth side, tips strongly recurved, very pale green or oak gray beneath, the young ones with fulvus hairs, very parchment-like; flowers odorless, suberect, densely clustered upon the uppermost side of the twigs and in the leaf axils, yellowish green except the dull yellow anthers.

Represented by numbers 13053, 12955 and 12890, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April, 1911.

All of these were collected in good humus covered moist soil of woods or forests between 50 and 750 feet altitude.

The last number cited is quite a fine forest tree, with smaller leaves and profuse citrinus flowers. It approaches *C. isabellinus Elm.*

Cleistanthus decipiens C. B. Rob.

Field-note for 12988:—Shrubby; stems few from the same

cluster, ascending or widely spreading, few inches thick, terete, 15 feet long, branched from below the middle; wood quite hard and heavy, the outside sappy white, the greater central portion dull incarnatus, without odor or taste; branchlets laxly spreading; bark thin, yellowish brown, more or less minutely checked; castaneus except the epidermis; leaves thinly coriaceous, flat, deep green above, much paler beneath, horizontal or descending; young fruits solitary in the leaf axils, subtended by dry brown scales; the capsule erect, shining and very pale green, roundly 3-lobed, less than 0.5 inch across, 3 celled, 1 or 2 ovules in each.

Represented by numbers 12988 and 12888, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April, 1911.

Collected in very fertile soil covered with humus in a densely wooded creek bottom at 250 feet. Number 12888 was gathered in dense humid forests at 750 feet altitude.

DAPHNIPHYLLUM Blm.

Daphniphyllum glaucescens Blm.

Field-note:—A rigid interlaced shrub; leaves rigid, very shining green above which in the dry state is jet black, glaucescent beneath; spikes axillary, much shorter than the foliage, greenish.

Represented by 13194, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

On the summit of mount Pulgar at 4250 feet.

DIMORPHOCALYX Thw.

Dimorphocalyx murina Elm. n. sp.

An erect slender tree; stem terete, 1 dm. thick, 7 m. high, with its main branches from below the middle; branches numerously rebranched and spreading, the ultimate ones suberect and young tips glabrous; wood moderately soft yet solid and quite heavy, the outer one half sappy white, the balance yellowish tinged, odorless and tasteless; bark smooth, yellowish gray or

grayish white, latericius except the epidermis. Leaves few, scattered alternatingly, horizontal and descending, flat, subchartaceous, very deep green above, much lighter so beneath, entire or distantly apiculate, characteristically turning murinus upon drying, glabrous, exceedingly variable in size and somewhat in shape, oblong to obovately oblong, the average blades 12.5 cm. long by 6 cm. wide across the middle or above this, apex acute to acuminate, base acute to broadly obtuse; midvein stout, the 7 to 11 lateral pairs divaricate and with ascendingly curved more or less united tips forming a marginal line 5 mm. from the leaf edge, reticulations nearly obscure; petiole also stout, 7.5 mm. long, glabrous, caniculate along the upper side; bud bracts short and broad, nearly glabrous. Inflorescence erect, terminal or from the uppermost leaf axils, more or less 1 dm. in length and occasionally provided with foliaceous bracts below the middle, at the base subtended by persistent bud bracts, only sparingly short branched and then the branches subtended by similar bracts; flowers in few scattering groups, their pedicels very slender and 5 mm. long, all subtended by unequally sized bracteoles; perianth of 2 distinct series, whitish; the outer series composed of 5 segments united toward the base, rather thick and rigid, subglabrate or only sparsely ciliate especially along the edges, oblongish, with rounded apices, 5 mm. long, 2.5 mm. wide; the inner series of the same number of segments, thinner in texture, white in color, glabrous, 8 mm. long, one half as wide, elliptically oblong, broadly rounded at apex which usually becomes recurved, inserted upon the lower series; scales about 8, short, lobulate or more or less united into a rim between the perianth and anthers, ciliate along the edges; stamens about 18, more or less united into a fleshy white column or the lower ones upon nearly free filaments, the uppermost ones only upon short filaments, all glabrous and fertile; anthers thick, blackish brown, 1 mm. across, much compressed and peltately arranged, ovately rotund, bifid at the base, attached in the sinus from the lower side, dehiscing along the edges, light sulphur yellow when fresh; pedicels of fruits 2 cm. long, very stout, strict, suberect; capsules 1.5 cm. across, the 3 lobes creased, quite hard, subtended by the persistent and much enlarged perianth segments, 3-celled and bearing an equal number of seeds, strigosely hairy but when fully mature glabrate, shining green but upon drying turning nearly black;

stigmas 3-forked, sessile, flatly spreading, main arms flattened, glabrous on the upper side, pubescent otherwise.

Type specimens 12773 in flower and 13156 in fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and May respectively, 1911; also number 12844 from the same locality.

Discovered all three specimens in moist humus covered soil in dense forests or along stream depressions from 500 to 1750 feet elevation.

Numbers 12844 and 12773 are alike, the fruiting specimen is a little different, all are quite distinct from *D. luzoniensis Merr.*

EXCOECARIA Linn.

Excoecaria philippinensis Merr.

Field-note:—Erect or suberect small tree; stem terete, 6 inches thick, 15 feet high, its few main branches arising from the middle; wood light, soft, without odor or taste, the sapwood white, becoming testaceus toward the center; bark thick, milky, dull brown and deeply checked on the surface, the middle region latericius; leaves ascending, coriaceous, flat, dark green above, yellowish so beneath; spikes erect, strict, mostly terminal, pale green, the anthers deep yellow.

Represented by number 13124, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Rare in stony red soil of secondary forests at 250 feet altitude.

FLUGGEA Willd.

Fluggea virosa (Willd.) Baill.

Field-note:—Low shrub-like tree; stem 10 inches thick, nearly 20 feet high, with its main branches arising from below the middle, finely and numerously rebranched toward the top; wood testaceus or incarnatus toward the center, rather hard and heavy, odorless, bitterish; bark of the same color even on the smooth outside, scaling in plates; branchlets very lax and

spreading; leaves not quite mature, membranous, shining and deeper green above, horizontal or descending, usually folded on the upper side; flowers delicate in texture, umbellately spreading, odorless, deciduous, profuse, green except the whitish filaments and with deep yellow anthers.

Represented by number 13132, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In wet sand gravelly soil of the Iwahig river flat at 250 feet. Only once seen and it seems to be deciduous.

GLOCHIDION Forst.

Glochidion molle Muell. Arg.

Field-note:—Shrubs in several stemmed clusters; stems 3 to 5 inches thick, their main branches arising from below the middle, the branchlets widely spreading; wood soft, reddish especially the central portion; without odor or taste; bark smooth, grayish, dark brown beneath the epidermis; leaves horizontally spreading, chiefly at the ends of the branchlets; leaflets soft, membranous, recurved but otherwise nearly flat, yellowish green beneath; flowers ascending; fruits mostly pendant.

Represented by number 12605, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Inhabiting dry compact soil of hot shruberries or light woods intermixed with cogon and bamboos at 25 feet altitude. "Pia-as" is the native or Tagbanua name.

Glochidion littorale Blm.

Field-note:—Tree-like shrub; stem 5 inches thick, 15 feet high, with main branches arising from below the middle; wood slightly bitter, odorless, moderately hard and heavy, gradually reddening from the sappy white wood toward the center; bark reddish brown except the checked and more or less shredded surface; branchlets numerous, the main branches long and spreading; leaves coriaceous, nearly flat, glabrous green beneath, deep green above, ascending; fruits in small axillary clusters, when mature smooth and apple red, at least 0.5 inch across, equally

flattened at both ends, subtended by 5 or 6 green calyx segments, 10-seeded.

Represented by number 12689, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Gathered in moist sand gravelly soil fronting the beach forests. The Tagbanua or vernacular name is "Tabango." Not common in Palawan and is rarely known from other Philippine localities.

Glochidion balsahanense Elm. n. sp.

Shrub; stem 5 to 8 cm. thick, 4 m. high, branched from near the base; main branches spreading, numerously rebranched, the ultimate twigs green and glabrous, when dry reddish brown; wood rather hard, odorless and tasteless, the outside sappy white, the central mass a trifle reddish tinged; bark castaneus on the deeply checked outer surface, umber brown otherwise. Leaves also glabrous, alternatingly scattered along the branchlets, mostly horizontal, chartaceous, shallowly folded upon the upper deeper green surface, recurved especially toward the apex, entire, the younger ones pale green, 7 to 10 cm. long by 4 to 5 cm. wide across the middle, bluntly acute at apex, base rounded or roundly obtuse and frequently inequilateral, subelliptic or broadly oblong, drying very dull brown; midvein conspicuous beneath, lighter brown in the dry state; lateral nerves 5 to 7 pairs, divaricate, tips strongly curved ascendingly, anastomosing, much less prominent, reticulations very fine and obscure; petiole 3 mm. long, glabrous. Staminate flowers clustered from the leaf axils, spreading, melleus, the buds green; pedicels varying up to 5 mm. long, glabrous, subtended at the base by minute and subglabrous bracteoles; pistillate flowers sessile in the leaf axils, ovary and style column pubescent, the 5 stigmatic segments short and glabrous; perianth segments 6, imbricate, united at the base, yellowish green, glabrous, ultimately spreading and recurved, oblong, 2.5 mm. long by 1.5 mm. wide across the middle, with rounded or obtuse apices; stamens erect, forming a short thick column, 5; anthers longitudinally dehiscent, 1 mm. long, the thick and rigid connectives protruding into 3 blunt points; capsule becoming glabrous, flattened, 1.25 cm. across, between purpureus and atropurpureus on the exposed mature

fruits, whitish green on the shaded side or base, the persistent calyx also becoming red, 6-lobed and 6-celled, bearing a prominent short green style; seeds usually 2 in each cell, deep miniatus, finely velvety in appearance, angular on the inner sides, convex on the dorsal or back, 5 mm. across.

Type specimen 12856, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Inhabiting gravelly soil of the densely wooded banks of the Balsahan river at 250 feet.

Between *G. mindorense C. B. Rob.* and *G. currani* of the same anther.

Glochidion palawanense Elm. n. sp.

Erect and tree-like shrub; stem solitary or few from near the ground, 1 dm. thick, 5 m. long, branched from below the middle, branches freely rebranched and widely spreading, the glabrous and green twigs striately ridged; wood gradually changing from the nearly white sapwood to the incarnatus red heartwood, quite heavy and hard, without odor or taste; bark yellowish gray and checked, otherwise light atropurpureus. Leaves coriaceous, nearly flat, gracefully recurved toward the gradually tapering acute to acuminate point, margins entire, shining on both sides though paler beneath, shining and blackish brown on the upper side after being dried, dull and glaucous brown beneath, base acute to roundly obtuse and occasionally inequilateral, oblong, the average blades 1 dm. long by 3.5 cm. across the middle, frequently much smaller and broadly lanceolate, midvein prominent beneath, blackish; lateral nerves 6 to 8 pairs, oblique, strict, obscure, their tips more or less interarching far below the margin, equally visible from the upper side, reticulations coarse and very obscure; petiole glabrous, 3 mm. long, stipule thick, acute, as long as the petiole. Male flowers in few axillary clusters, glabrous, upon few mm. long more or less recurved pedicels, quite brittle, sulphureus; perianth chiefly composed of 5 or 6 segments, more or less united about the base; segments 3 to 4 mm. long, 2.5 mm. wide across the middle, thick, rigid, elliptic or ovately so, glabrous, with scattered excrescences or lenticels on the dorsal side mostly, the inner ones smaller, imbricate; stamens 3, in a united column, erect, rigid, 1 mm. long, the anther cells longitudinally

dehiscent and yellow, the connectives protruding into 3 short blunt and deep brown nearly free points; fruits clustered along the upper side of the branchlets at the leaf axils, stramineus to white, flattish globose, 1.75 cm. across but often less, glabrous, more or less irregular and the sunken apical portion tinged with light purple, normally 5 or 6-celled and with 2 seeds in each; seeds 6 mm. thick, angular on the inner sides, convex on the dorsal side, shining, aurantiacus.

Type specimen 12804, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in stone gravelly soil and fronting the wooded banks of the Iwahig river at 500 feet. Rare!

As near to *G. merrillii C. B. Rob.* as to any other of our Philippine species.

Glochidion pulgarense Elm. n. sp.

A low rigid shrub; ultimate branchlets numerous, erect, glabrous, relatively short, nearly black when dry. Leaves copious, alternatingly scattered, glabrous, quite rigid, darker green on the upper side, turning blackish while curing, elliptic or obovately so, margins entire, apex rounded, base obtuse, diverse in size, the normal mature blades 4 cm. long, 2.5 cm. wide across the middle or just above it; midvein brownish black, conspicuous beneath; lateral nerves 3 to 5 on each side, similar in color, rather obscure, divaricate or the basal pair oblique, quite straight but usually irregularly forked toward the distal ends and more or less interarching, reticulations coarse and still more obscure; petiole only 1 to 3 mm. long; stipules triangularly acuminate, only 1 to 2 mm. long, rigid and thick, glabrous or minutely ciliate along the margins; buds subtended by numerous imbricated similar bracts. Male flowers upon glabrous 2 mm. long pedicels, subtended by stipular bracts, from the axils of the uppermost leaves or in small clusters along nearly leafless dwarfed branchlets; female flowers sessile, the glabrous subangular style 4 mm. long, erect, minutely 3-toothed at apex; perianth segments united at the base, 6, the inner 3 usually smaller, thick, rigid, glabrous, imbricate, elliptically oblong, with roundly obtuse apices, in anthesis spreading and only slightly recurved, 3 mm. long by one half as wide across the middle; stamens 3, in an erect

column, 1.5 mm. long; the pale yellow anthers 2-celled, longitudinally dehiscent; the thick, dark brown connectives protruding into 3 short obtuse points, closely clubbed together; capsule glabrous, nearly 1 cm. long, slightly obovoidly globose, with truncate apex bearing the persistent style.

Type specimen 13215, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This shrub was gathered from the summit of mount Pulgar at 4000 feet, where in associations with other low interlaced shrubs it forms dense rigid chaparral growths.

GELONIUM Roxb.

Gelonium subglomerulatum Elm. n. sp.

Slender erect tree of small stature; stem terete, nearly straight, 2.5 dm. thick, 9 m. high, branched chiefly at the top; wood white, moderately hard, light, odorless, sweetish; bark rather smooth, grayish mottled, dry and whitish except the epidermis; branches numerously and crookedly rebranched, the ascending twigs quite rigid, the leaf bearing portion glabrous and very dull green. Leaves alternate, scattered along the ultimate glaucous brown twigs, elliptic to oblongish or obovately oblong, the entire margins recurved in the dry state, ascending, shining on both sides, paler green beneath, nearly flat, glabrous, rounded or bluntly obtuse at apex, base frequently a trifle inequilateral, cuneate or obtusely rounded, the average blades 7.5 cm. long by 4 cm. wide across the middle or immediately above it, curing greenish, coriaceous; petiole glaucous brown, 7.5 mm. long, stout, midvein prominent beneath; the 5 pairs of lateral nerves ascending, much less conspicuous beneath, more prominent on the upper surface in the dry state, their tips curved and more or less united, cross bars and reticulations quite obscure. Flowers deciduous, odorless, fascicled in the lowermost leaf axils or in their scars, upon very short bracteated stalks; pedicels 1 to 2 mm. long, glabrous, fleshy; perianth segments 5, glabrous, ochraceus, elliptic or oval, imbricate, more or less united toward the base, the inner ones smaller, 5 mm. long, margins thin or subhyaline; stamens indefinite, centrally clus-

tered; filaments averaging 5 mm. long, at the base united into a fleshy mass, glabrous, subequal; anthers ovately oblong, 1 mm. long, 0.75 mm. wide, basifixed, cordate at base, emarginate at apex, cremeus as are also the filaments; fruits 1.25 cm. thick, green, turning roseus to incarnatus when mature, orange red when dry, 3-celled and 3-ovuled but usually only 1 develops to maturity, subglobose, glabrous, subtended by the perianth.

Type specimens 12967 in flower and 12726 in fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April, 1911.

A characteristic tree in the secondary forests of the vast level tract of land built up mainly by gravelly residue from the near mountain range.

It does not agree with the description nor with Malayan specimens of *G. glomerulatum Hassk.* although very closely related to it.

Gelonium pulgarense Elm. n. sp.

An erect and quite a rigid shrub; branchlets ascending, numerous, gnarly appearing, glabrous, covered with smoothish yellowish gray bark, the green tips glabrous and when dry reddish brown. Leaves alternate, chiefly toward the ends of the twigs, suberect, flat, glabrous, unequal in size, the entire margins revolute in the dry state at least, the larger blades 4 cm. long by 2.5 cm. wide across the middle or a trifle above it, the roundly obtuse base frequently a trifle inequilateral, apex rounded, papillately punctate on both sides, elliptic or the smaller ones rotund; midvein prominent beneath, glabrous; the 3 to 5 lateral ones faint, their tips becoming invisible, reticulations none; petiole only a few mm. long, glabrous; reddish brown. Flowers in small clusters, in the leaf axils mostly, glabrous; buds globose, also glabrous; the glabrous and subcoriaceous pedicels 3 mm. long, subtended at the base by minute bracteoles; perianth segments about 5, imbricate, unequal, glabrous except the subhyaline margins which are finely ciliate, suborbicular or the inner ones oblong; stamens indefinite, centrally clustered upon a fleshy receptacle; filaments glabrous, pale yellow, subequal,

2 mm. long; anthers 0.75 mm. long, oblong, basifixed, shallowly cordate at base, rounded or emarginate at apex, longitudinally dehiscent.

Type specimen 13819, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Collected in the chaparral formation on the summit of mount Pulgar at 4250 feet altitude.

Ours differs from *G. aequoreum Hance* in the leaves being papillate and without the prominent nerves and reticulations. Possibly it should be considered only an alpine variety of the preceding.

HOMALANTHUS Juss.

Homalanthus populneus (Geisel) Pax.

Field-note:—A stocky low tree, with a round spreading crown; stem erect, 8 inches thick, 20 feet high, crooked yet terete; the main branches arising from below the middle, ascending, ultimately widely spreading and numerously rebranched; wood soft, dingy yellowish white, without odor or taste, light; bark brown and gray mottled, with grayish lenticels, yellow on the inside; branchlets erect, green; petioles reddish, mostly ascending; blades descending, subcoriaceous, very smooth, deep green above, much paler or glaucous green beneath, curving upon the upper side; staminate spikes terminal and erect, the male flowers yellowish and sessile; the few female are near the base and upon slender ascending pedicels; fruits glaucous green except the yellowish green stigma lobes, obovoidly compressed; seeds 2, attached from the apex of the central placenta, pendant after the exocarp has fallen, brown, slightly rugose, trigonous, the inner side amply covered with a juicy deep red meat.

Represented by number 12612, *Elmer,* Brooks Point (Addison Peak), Palawan, February, 1911.

One of the common secondary forest trees in rich soil along the Lara river near the seacoast. "Buntatoli" is the native or Tagbanua name.

MACARANGA Thour.

Macaranga tomentosa Muell. Arg.

Field-note:—A small erect or ascending tree; stem 10 inches thick, 20 feet high, widely branched from above the middle; wood soft and light, white, odorless and tasteless; bark gray mottled, brown except the epidermis, roughened with excrescences; branches numerous, forming an umbrella crown, smooth, dark green and occasionally glaucous, the twigs ascendingly curved; blades pendant, soft membranous, deep green on the outer side, glaucous green beneath, veins yellowish white; inflorescence ascending, yellowish green, the anthers deeper yellow.

Represented by number 12694, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

This tree was found in moist subsaline soil fronting the dense beach woods. Its vernacular Tagbanua name is "Binwau."

Macaranga hispida Muell. Arg.

Field-note:—Small tree; stem 6 inches thick, 20 feet high, terete, its main branches arising from below the middle; wood light, odorless and tasteless, silvery white, very soft; bark very smooth, grayish white, with a green hypodermis; larger branches widely spreading, sparingly rebranched; the branchlets very slender, with suberect tips, the twigs have hispid hairs somewhat stinging in effect; leaves diverse in size, upon ascending yellowish green petioles, blades horizontal, mostly flat, darker green above, the larger ones 2 feet long; infrutescence upon pale green ascending peduncles, usually solitary; the compressed and roundly 3-angled capsule covered with a sulphureus powder and light green appendages; the green smooth perianth of the ovary early falling; the 3 or 4 recurved stigmas nearly sulphureus.

Represented by number 12987, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In moist soil covered with low soft grass species of open woods of a small creek bottom at 250 feet.

MALLOTUS Lour.

Mallotus anisophylla Hook.

Field-note:—An erect sparingly branched shrub; stems usually few from the same root cluster, 1 inch thick, 6 feet high, terete; wood closely grained, white, odorless and tasteless; bark smooth, grayish green, relatively thin; branchlets few, more or less recurved; leaves imparipinnate, diverse in size, chartaceous, paler green beneath, flat or only the apex recurved; male spikes erect from the leaf axils, green, the bract tips brown, the calyx and stamens pale sulphureus; the pistillate flowers on different plants, similarly disposed, their calyx and ovary green, the 3 large stigmatic forks nearly citrinus.

Represented by number 12817, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Rather freely scattered in dry more or less fertile soil of shruberries bordering grass fields.

Mallotus philippinensis Muell. Arg.

Field-note for 12657:—Erect tree; stem 10 inches thick, wadded toward the base, 30 feet high, branched from above the middle; wood slightly bitter, quite hard, odorless, whitish; bark mottled, smooth, deep reddish brown except the epidermis and pale inner side; branches grayish white, numerously and crookedly rebranched, forming a dense crown; the apical portion of the twigs erect and yellowish brown scurfy; leaves horizontal, flat, chartaceous, deep green above, much lighter green beneath, the veins yellowish green; inflorescence also yellowish green, terminal, erect, the spikes fascicled from the uppermost leaf axils; flowers odorless, caducous, more yellow, the perianth segments reflexed in anthesis.

Represented by number 12657, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911; also number 13049 from Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This was collected in good soil of densely wooded flats near the coast, the last number upon rocky banks of the Iwahig river at 500 feet. The Tagbanua or native name is "Tutula."

Mallotus moluccanus Muell. Arg.

Field-note:—Small or medium sized tree; stem 1 foot thick, crooked, not terete, 30 feet high, with its main branches from the top only; wood yellowish or dingy white, odorless and without taste, moderately soft, light, splendid for cutting and carving purposes; bark yellowish gray mottled, thinly checked longitudinally, hypodermis yellow; branches not numerous but widely spreading, the ultimate ones slender, yellowish gray, the tips suberect; leaves horizontally spreading, subcoriaceous, folded upon the upper much darker green surface; inflorescence terminal, erect, all the stalks yellowish green and scurfy brown pubescent; flowers odorless, somewhat succulent; perianth pale green on the upper surface, the lower similar to the stalks; stamens light creamy yellow; fruit subpendulous, strongly trigonous, green, 3-celled, less than 0.5 inch across, flattened.

Represented by number 12666, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Collected in damp black soil of dense forests at 25 feet altitude near the coast. The Tagbanuas call it "Girangan." It is exceedingly hard to cure and consequently most herbarium specimens are in a somewhat rotten condition.

Mallotus floribundus Muell. Arg.

Field-note for 13024:—Usually small somewhat gnarly appearing tree; stem 10 inches thick, 30 feet high, wadded, always extending a trifle over the creek bed, its main ascending branches arising from below the middle; branches numerously rebranched, widely spreading, forming a lax and flattish crown, the leaf bearing portion of the twigs green and suberect; wood moderately soft, white on the outside, gradually becoming yellowish toward the center, odorless and tasteless; bark grayish white mottled, latericius except the smooth epidermis, on the branches easily stripping; leaves horizontal or subpendant, curved upon the lower conspicuously glaucous green surface, shining and of a rich green above, the young foliage reddish tinged; inflorescence terminal, the stalks subglaucescent; the ovary and stigmatic brush yellowish, the ovary appendages subglaucescent.

Represented by numbers 13024 and 13026, *Elmer*, Puerto

Princesa (Mt. Pulgar), Palawan, April, 1911; also number 12702 Brooks Point (Addison Peak), Palawan, February, 1911.

Collected in rather moist yet shallow soil with a gravelly or stony subsoil along wooded banks of cool streamlets at 750 feet altitude. The Brooks Point specimen is more typical, the Puerto Princesa specimens were found in the woods back of the seacoast. The Tagbanuas call it "Bagnau." Number 13026 or the male flowers was collected a few rods from 13024 and is profusely floriferous just prior to the development of its foliage. Along this same stream there are probably ten pistillate trees to one staminate, and the pistillate are not deciduous as the staminate trees are. All are very aromatic especially so after being dried. A number of other species possess this same characteristic odor.

Mallotus lackeyi Elm. n. sp.

Tree-like shrub; stems 2 to 3-clustered, ascending, ultimately reclining over the creek bed, 1 dm. thick, 5 m. high, branched from near the base; wood odorless and tasteless, white except the avellaneus heartwood, light, dry and rather soft; bark smoothish, grayish white except the testaceus inner portion; main branches numerously rebranched and recurved, the ultimate ones lax and suberect, the terminal portions velvety pubescent. Leaves alternate, mainly toward the ends of the rather short ultimate branchlets, soft submembranous or thinly chartaceous, much paler green beneath, drying greenish brown, flat or only the caudate tips recurved, diverse in size, peltate, short and finely tomentose beneath, subglabrous above, minutely sprinkled with glistening glands on both sides, entire or shallowly denticulate, at least the broad rounded base always entire, ovate to ovately oblong, the average blades 2 dm. long by 9 cm. wide across the base; petioles ascending, soft hoary pubescent, about 5 cm. long, attached to the leaf 1 cm. from its basal edge; the midvein straight, the 7 to 9 oblique pairs strict and subparallel, the basal 2 pairs divergent and descending, the secondary from the lower side of the first or basal pair, of the ascending pairs usually 5 and relatively descending, cross bars also conspicuous, all pubescent beneath and slightly so on the upper side along the larger grooved nerves and midvein; bud bracts 7.5 mm. long, densely tomentose on the outside, acuminate, rather numerous. Spikes suberect,

usually curved toward the top; 1 to 3 dm. long, green, softly pubescent; flowers usually grouped yet irregularly scattered especially toward the distal end, subsessile, subtended by 5 mm. long densely hairy bracts; pedicels also finely hairy, 1 to 2 mm. long; calyx greenish, united at the base, striate or veined, finely pubescent especially along the margins; segments 4 mm. long, lanceolate, slenderly acuminate; ovary dark green, flattish, obscurely trigonous or subglobose, soft pubescent, with minute yellow glands; stigma sessile, 3, fleshy, 5 mm. long, twisted and strongly recurved, glandular and pubescent on the nether side, the stigmatic surface brush-like; cells 3; ovules 3, subpendant from a central placenta; capsule subglobose, trigonous, 3-celled and 3-seeded, about 12.5 mm. across.

Type specimen 13017, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in shallow red damp soil underlaid with gravel stones along a densely wooded stream bank at from 750 to 1750 feet altitude. Flourishes best on seepage ledges near pools over which the branches extend most profusely. Dedicated to ***Lieut. J. O. Lackey.***

Mallotus odoratus Elm. n. sp.

Shrub; stem 3 to 5 cm. thick, 3 to 4 m. high, usually in clusters of few to several, branches arising from below the middle freely and laxly rebranched, the ascending tips puberulent or becoming subglabrous; wood soft, whitish, without odor or taste; bark grayish mottled, smooth or finely lenticelled, reddish brown on the branchlets, the old bark rather brittle, hypodermis green. Leaves alternatingly scattered, horizontal or mainly descending, ample, diverse in size, membranous, nearly flat, frequently somewhat twisted toward the slenderly acuminate recurved apex, greenish brown upon drying, diverse in size but not in shape, the larger blades 15 cm. long, 5 to 6 cm. wide across the middle, oblong to ovately oblong but usually widest across the middle, base auriculately cordate, entire and slightly narrowed from the middle to base, above the middle subentire or obscurely dentate, glabrous; midvein pronounced beneath, strigose; main lateral pairs about 6, strict, very oblique, nearly as prominent as the midvein and similarly hairy, the basal pair with 3 to 5

secondary nerves on their lower sides, cross bars faint and nearly glabrous; petiole 1 to 3 cm. long or longer, terete, finely pubescent. Inflorescence green, erect or suberect, terminal; spikes slender, usually clustered and unbranched, 3 to 5 cm. long, short stellately pubescent; flowers rather crowded especially toward the top, solitary or 2 or 3-clustered, subtended by short relatively broad grayish white pubescent bracts; the ovoidly globose buds similarly hairy; pedicels slender, 2 mm. long, shortly but densely stellate pubescent; sepals 3, nearly free, elliptic, acute or obtuse at apex, 2 mm. long by 1.25 mm. wide across the middle, yellowish green, similarly pubescent on the back, with a conspicuous midvein; stamens 20, all parts glabrous, centrally clustered; filaments varying from 0.5 to 1.5 mm. long; anthers broadly bilobed at the base, shallowly emarginate at apex, 0.5 mm. long, fully as wide, the widely separating 2 cells dehiscing along the edges, basifixed.

Type specimen 12584, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, February, 1911.

This sweetly scented *Mallotus* was collected along the old Spanish road cutting across the fertile forested Puerto Princesa flat peninsula and terminating on the north east coast. A Christian Philippino called it "Soman." *M. lackeyi Elm.* possesses the same fragrance and both of our new species are the same as *M. floribundus Muell. Arg.* in that respect. The odor must lie in the whole plant, in the flowers, fruits, leaves and wood. I have seen wild tribes stringing the seeds of *Mueller's* species among their beaded neck wear for the sake of the aroma.

MICRODESMIS Hook.

Microdesmis philippinense Elm. n. sp.

Shrubby or tree-like; stem 1 dm. thick, 5 m. high, widely branched above the middle; wood moderately hard, odorless and tasteless, yellowish white; bark mottled, smooth; branches laxly and numerously rebranched, the slender green twigs glabrous except the slightly hairy young portion. Leaves alternatingly scattered along the branchlets, glabrous when mature,

shining on both sides, chartaceous, mostly descending, flat, the acuminate tips recurved, a trifle deeper green above, base inequilaterally obtuse to acute, drying dull green, oblong or lanceolately so, margins entire or very minutely denticulate above the middle, exceedingly variable in size, the larger blades 12.5 cm. long by 4 cm. wide across the middle; midvein thinly strigose in the early state, prominent, glabrous when old, yellowish brown; lateral pairs 5 to 8, quite prominent, ascendingly curved, tips interarching far below the margin, reticulations quite evident especially from beneath; petiole 7.5 mm. long, slender, ultimately glabrous, turning reddish brown while drying; bud bracts about 5 mm. long, sharply acuminate, soft, densely pubescent. Flowers 1 to 2 mm. long, pedicellate, the buds green, the petals luteus, odorless, densely crowded into axillary glomerules, their glabrous stalks subtended by persistent soft grayish pubescent bracteoles; calyx at least 1 mm. long, sparsely hairy or ciliate, ovate, more or less united at the base, green, 5; petals aureus; spreading, glabrous, oblong, 2.5 mm. long, obliquely rounded at apex, obscurely constricted toward the base, 1.25 mm. wide, stamens 10, erect; filaments glabrous, terete, relatively thick, 0.5 mm. long, articulate at the base; anthers scarcely longer, nearly as wide, the 2 cells laterally dehiscent, bilobed, basifixed, apiculate; pistil mass ellipsoid, 1.5 mm. long, acuminate, the sessile and truncate stigma finely pulverulent; fruits pendant, obovoidly globose, 6 mm. in diameter, nearly luteus when mature, upon slender 5 mm. long pedicels, the anther perianth series persistent and glabrous; seed usually solitary, rugose, nearly black, crustaceous.

Type specimens 12620 for flower and 13151 for fruit, *A. D. E. Elmer*, the former from Brooks Point (Addison Peak), the latter from Puerto Princesa (Mt. Pulgar), Palawan, February and May respectively, 1911.

Both numbers were collected in good soil of moist woods or humid forests at 250 feet. "Bunga-bunga" is the local or Tagbanua name for the Brooks Point specimen.

It seriously differs from the description of *M. casaeriaefolia Plch.* in its petals not being orbicular nor pubescent on both sides; stamens in ours 10, their blunt anthers not long apiculate or caudate; and fruits when ripe yellow not red.

PHYLLANTHUS Linn.

Phyllanthus lamprophyllus Muell. Arg.

Field-note:—Shrubs, varying from a few feet to a few yards in height; stem few inches thick, branched all along, suberect, terete, crooked; wood solid, heavy, quite hard, odorless and tasteless, fumosus; old bark brown, deeply channelled longitudinally, relatively thick, on the branches thinly checked; rachis green; leaflets flat, ascending, shining deep green above, much paler beneath; flowers pendant, cremeus except the brown subtending bracts, minute, odorless; capsule also pendant, 0.25 to 0.33 inch across, subglobose, light green and with yellowish green longitudinal streaks, 3-celled, 6-seeded; seeds pale umbrinus, exocarp melleus, endocarp stramineus.

Represented by number 12733, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Thrives in compact gravelly soil along the banks of water courses at 250 feet. Very common and ornamental!

Phyllanthus glochidioides Elm. n. sp.

A lax suberect usually umbranched undershrub; stem terete, 2 m. high, 1.25 cm. thick, reclining upon adjoining shrubs toward the top, wood soft, whitish on the very outside, the central mass isabellinus, odorless and tasteless; bark testaceus except the greenish or outer smooth surface, gray toward the base; the twigs brown when dry, striate, slender, glabrate or finely pulverulent, suberect. Leaves alternatingly scattered along the twigs, ascending, flat, the acute or obtuse apex slightly recurved, rigidly coriaceous, entire, the younger ones at least glaucous beneath, very unequally brown in the dry state, subcuneately tapering toward the base or merely ovately oblong, 7.5 cm. long, 3 cm. wide across the middle, midvein conspicuous below toward the base, yellowish brown in the dry state; the 3 to 5 lateral pairs very oblique especially the basal ones, thin tips reticulately united, reticulations very prominent from both sides and rather coarse; petiole 5 mm. long, compressed, finely pulverulent, articulated at the base; stipule 3 mm. long, thick, spinescently pointed, subpersistent. Flowers umbellately spreading from the leaf axils; pedicels 5 to 7.5 cm.

long, pulverulent, brown when dry, gradually thickened toward the distal end, subtended by a whorl of involucral bracts; perianth 6, united toward the base, elliptically elongated, rigid, erect, glabrous, the tips at least dull flesh red, imbricate, 3 or more mm. long by 1.5 mm. wide across the middle, the inner 3 with thickened or glandular bases; ovary upon a thick base, smooth and glabrous, 2 mm. long, 1.5 mm. wide across the base, ovoidly conical, thick, 3-celled and 6-ovuled; stigma truncate, dark reddish brown, obscurely 3-lobulate; fruits pendant, yellowish and shaded a trifle red, angularly subglobose, 7.5 mm. across, smooth, hard, upon a pronounced green pedicel, subtended by the 6 greenish perianth segments with dark brown tips, 3-celled, 6-seeded.

Type specimen 13104, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered this large leafed *Phyllanthus* in reddish compact soil mixed with gravel stones near a stream of dense woods at 250 feet altitude and between the forks of the Iwahig river. Only a few plants were seen.

SAPIUM R. Br.

Sapium lateriflorum Merr.

Field-note:—Large or middle sized tree; trunk 2.5 feet thick, 45 feet high, with its main branches from the middle or above it; wood moderately soft, white at least on the outside, odorless and tasteless, fine for working purposes; bark thick, dull brown, numerously checked into small rather thick plates, reddish brown beneath the epidermis; the branches covered with reddish wart-like excrescences, crookedly branched and widely spreading, the twigs green and flexible; leaves descending, very smooth, coriaceous, apex twistingly recurved, lucid darker green on the upper surface which is usually concave; young infrutescence axillary, mostly ascending, all the stalks green; fruits pendant, unequally ellipsoid, 0.5 inch long, bearing at the apex a 2-lobed brown stigma; seed apparently only 1 in each fruit though probably 2-celled and 2-ovuled in the younger state.

Represented by number 12630, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

In sand gravelly soil of damp woods near the seacoast. The vernacular or Tagbanua name is "Mogalmod."

SUMBAVIOPSIS J. Sm.

Sumbaviopsis albicans (Blm.) J. Sm.

Field-note:—Small suberect trees or shrubby; stem 0.5 foot thick, branched near the top; wood quite soft, yellowish white, odorless and tasteless; bark smooth, dark brown and grayish white blotched, the inner portion yellowish; branches widely spreading, crookedly rebranched, the ultimate ones lax, the suberect twigs dirty green; leaves flat, the old ones turning yellow, horizontal, diverse in size, deep green above, chalky white beneath, submembranous, the petioles yellowish green; inflorescence terminal or from the uppermost leaf axils, all the stalks green and covered with a scurfy brown integument, suberect; flowers odorless, the male sessile, the female ultimately upon 1.25 inch long usually recurved pedicels; perianth scurfy brown on the outside, green on the inner, stamineal tube greenish, anthers creamy white; pistil greenish and finely scurfy with scales or hairs; fruits pendant, trigonous, flattened, 0.75 inch across, scurfy brown.

Represented by number 12636, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Collected in moist black humus covered soil of dense woods at 25 feet elevation. Rare and not before reported from the Philippines. The natives or Tagbanuas call it "Dabdab-balod."

TRIGONOSTEMON Blm.

Trigonostemon merrillii Elm. n. sp.

A lax shrub; stem 2.5 cm. thick, solitary or occasionally few from the same root cluster, 2 to 3 m. high, very sparingly branched toward the top or not at all; wood odorless and tasteless,

pure white on the outside, otherwise dingy; bark grayish, smooth or minutely checked, roughened with excrescences; twigs tough, greenish, suberect, soft, melleus, hirsute. Leaves horizontal or descending, submembranous, flat, paler green beneath, quickly drying green, entire, the average blades 2.5 cm. long by 1 dm. wide above the middle, obovately oblong, apex obtusely rounded to acute, gradually narrowed to the bluntly rounded base, soft hirsute pubescent on both sides especially beneath, not numerous, alternatingly crowded toward the distal end; stout midvein brown, quite conspicuous on the upper side; lateral pairs about 15, ascendingly curved, the basal ones straighter and more ascending, yellowish green, the green cross bars evident from beneath; petiole extremely stout, 2 to 4 cm. long, subterete, similarly hairy. Inflorescence ascending from the leaf axils; the slender similarly pubescent stalk 1 to 2 dm. long, flower bearing from above the middle; the larger or lower floral bracts lanceolate and 2 cm. long, yellowish green and soft hairy, pedicels or stalks 1 cm. long; staminate flowers usually in small clusters, all more or less pendant; sepals imbricate, unequal, 5, united below the middle, obovately oblong, averaging 1.5 mm. in length, the outer ones with few but long setae along the median region on the back above the middle, spreading in anthesis; petals free, as many as there are sepals, 2.25 mm. long, subequal, glabrous, deep purple even in the globose bud state, obovate, contracted toward the base, thickened or glandular on the upper side at the base, nerved, also imbricate; gynaphore short and thick, purple, terete, glabrous, centrally arising from a short cup shaped very dark purple glabrous rim; anthers 3, sessile, borne at the distal end of the columns, attached at the base on the inner side, apiculate, divided nearly to the base, creased and dehiscent along the dorsal median line, 0.5 to 0.75 mm. long; capsule also pendant, flatly trigonous, 1.25 cm. across, 3-celled, 3-seeded, glabrous; seeds streaked or conspicuously mottled.

Type specimen 12819, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This undershrub was discovered in rich humus covered soil of forests at 750 feet. Named after *Mr. E. D. Merrill* who had partly worked it out from specimens collected by *H. M. Curran* of the Forestry Bureau.

The writer takes this opportunity of transferring *Croton longipedunculatus Elm.* Leaf. Philip. Bot. I; 311, 1908 to *Trigonostemon longipedunculata Elm.* n. comb.

LEAFLETS OF PHILIPPINE BOTANY

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A FASCICLE OF SIBUYAN FIGS

By

A. D. E. Elmer

The island of Sibuyan is centrally situated in the Philippine archipelago as well as in the center of the Visayan region. Politically it belongs to the province of Capiz, northern Panay; and with Romblon, Tablas, Carabao and Borocay islands, it seems to indicate a geological connection with the northwestern point of that same island. In shape it is obscurely or roundly triangular, with the sharper or longer angle toward the south.

The greater portion of its area is mountainous, the central being occupied by a mountain mass called Giting-giting or Guiting-guiting. The main spur from this central mass extends southward; the main secondary one extends northwestward and ends in a massive roundish peak possibly 2500 feet high. Minor ridges descend toward the eastern and the northeastern portion of the island. Mount Giting-giting itself is over 6000 feet high and is most abrupt from the north side where it extends nearest to the sea. The real summit portion from the north or northwest appears as a series of five or more sharp digitate points (the local Visayan name Guiting-guiting has reference to the five points or fingers of a hand). These nearly precipitous peaks are not of equal sizes nor heights, the larger of which have a few thousand feet drop into the beginning of the Pauala river which heads along the basal flanks of these "Sierras."

At first this rivulet is in itself a series of falls or cascades and is a narrow gorge hemmed in by rocky walls. Its bed is

filled or strewn with bowlders of all sizes, some of which are large enough to dam up the entire width of the gorge. As the river flows outward it makes a number of abrupt curves in order to avoid the hard rock masses in the minor spurs which extend down from the mountain ridges on both sides. Gradually it widens and the precipitous walls become reduced to mere rocky banks. The bowlders also become smaller but more numerous. Soon after it reaches the valley it makes a big turn and flows through meadow lands westward and joins the Patoo river nearly at right angles a mile or two before emptying into the sea. The Patoo river is smaller, heads in the forested ridges of middle and northwestern Sibuyan and flows almost due north. These two rivers form by far the largest river on this island.

The greater portion of the entire mountain mass is heavily forested, a marked distinction from the cogon region covering the greater area of Romblon and Tablas islands. Therefore, there is relatively little pastoral land and less agricultural land on Sibuyan. Most of the latter kind is in the southern part. On the east and northeastern side is an equal share of grazing and farming land. During Spanish times Magallanes exported considerable rice annually and the outline of the paddies is still noticeable. Nearly twenty five years ago a sugar plantation was started by wealthy Spaniards which has long since been abandoned. Their immense house, nearly 200 feet square, is inhabited by their younger countrymen who are mostly engaged in stock raising and hand lumbering. The lumber is chiefly sawed out of dipterocarp timbers. One species of this family yields considerable wood oil or "balao" for export. The cool and humid vicinity of Magallanes is said to be especially favorable for raising carabao or Philippine buffaloes, rather than bacas or native beef cattle. In fact all of these small islands, including southern Mindoro and the Busuanga group of islands formed in the past one of the greatest cattle regions in the Philippines. And those who were interested in the cattle raising business had singular success and well earned their profits.

There are passable trails along the coast clear around the island, no roads interiorly. Only recently the government built a good trail from Magallanes due southward to San Fernando by way of a small settlement called España. From

the northern pueblo this trail follows the Patoo river, crosses the divide at 2000 feet altitude and from España to the southern town it follows the coast. Romblon is the post-office for all the residents on the island and all the government officials of this subprovince reside in that town. Most all imports and exports come and go by way of Romblon. At times the provincial government maintains a small steamboat on the route between Capiz and Romblon, taking in all the pueblos and larger settlements on Sibuyan and Tablas islands. Between Romblon and Magallanes there are always native sail boats to be had during the calm season. These can carry quite a lot of cargo, including such as ripsawed lumber and occasionally as many as six carabaos or bacas find standing room in the hull of the Visayan "Vinta." In one of those I returned with my entire collection on a bright moonlight night upon a perfectly smooth sea, forged ahead by a steady heavy breeze.

There are no American residents on the island. The bulk of the property is owned by Spaniards and a few Chinese mestizos, half breeds between the Chinese and Philippinos. The largest town is San Fernando, located at the southern point. Cajidiocan on the eastern side and Magallanes on the northern are pueblos. Lubug and Ipil on the north and España on the west are very small settlements. The natives of Magallanes at least, are the poorest and most indolent of Christian Philippinos that I have ever seen. They seem to enjoy the laxative period of freedom. In the mountains are some of the Mindoro aborigines called Mangyans. They are roamers of the woods, occasionally coming into the valleys to barter with the Christian Philippino woodsmen for matches, salt, bits of cloth and the like. During my two to three months stay I failed to see a single member of those primitive folks although frequently early in the morning I have come across their small crude huts with a little fire still smoldering nearby. These huts when they stand out alone are conical or circular as an Indian wigwam. When they are built against bowlders along the river they are irregular in shape. The frame is of small stems of undershrubs, tied together with bajuco or rattan. The outside is overlaid with palm leaves and occasionally one finds in the tent a bunch of leaves which no doubt served as comforts to the occupants. These primitive houses are scarcely wider than a yard and twice as high, affording barely

room enough for a pair of pygmies. I have been told that on the long ridge extending from the mountain mass toward San Fernando there is quite a permanent colony of these primitive, shy and peaceful people, where they have better houses, larger families, some fields, and where they form a kind of community from whence the roamers start and to which the tired traveller may return.

The soil along the coast is mainly sandy loam, further inwardly and yet at nearly sea level of the adobe kind. Occasional ridges that extend to the coast end rather abruptly in a limestone formation. Throughout the forested ridges it is composed of a red sticky clay. Along the rivers of the foothills this red clay has a stony and gravelly subsoil, while on the ridges in the higher altitudes it is underlaid with a grayish green sandstone or serpentine shale. Much of this has the appearance of small glistening particles similar to mica. The summit outcropping from a close range seems to be composed of great masses of bold hard rock, possibly granite, quartz or marble. Between these there is a softer rock formation of a dull or reddish brown color.

Magallanes is very cool and humid for a seacoast place, due to the closeness of the mountains. Even during the dry season there are occasional heavy thunder showers. The rain fall that collects on the summit peaks drains off through the furrows between them and soon after a heavy shower and after the clouds have risen, it can be seen from the coast as parallel silvery white streaks as it plunges over the precipitous flanks into the head waters of the Pauala river. This fall varies from few hundred to a few thousand feet. I have counted as many as a dozen of those streaks, some larger and longer than others. On such days it is exceedingly dangerous to be well up in the river bed. The water collects and flows out surprisingly fast, its roar can be heard before the clear sparkling stream gives way to the madly rushing and rising muddy water.

The flora of mount Giting-giting is still very little known. The writer went there in March of 1910 and stayed until June or until weather becomes unsettled in the Visayan region. Most of my collection was done from Magallanes along the Patoo and Pauala rivers. Between these two rivers is a ridge following closely the western side of the Pauala river and which is heavily

forested clear up to 5000 feet altitude, the upper forests becoming low stocky trees. Along this ridge I was obliged to cut my own trail to nearly the uppermost apparently insurmountable central summit mass. I believe by making a camp at 4500 feet, a small mountaineering party can make it to the summit. Possibly a little reconnoitering will be necessary before a passable course can be found. All water for camping purposes must be taken along from the valley. My exploration work was therefore confined to the lower region, chiefly along the two already mentioned rivers. The vegetation along these rivers proved exceedingly interesting to me, because of its diversity. The Pauala river proved by far the more interesting and novel. This is mainly due to part of the summit vegetation having been washed down and disseminated as botanical floats along its course. Such evident examples are *Vaccinium gitingensis Elm.*, *Nepenthes sibuyanensis Elm.* and *Decaspermun grandiflora Elm.* Along this same river were found quantities of *Xanthostemon verdugonianus Naves* and which was never seen along the Patoo river. The fig flora of Sibuyan is poor and disappointing. Likewise the ferns, orchids, mosses and palms. Yet otherwise I am surprised at its novel character, many groups run over fifty per cent new, and the writer is certain that there are still remaining many unknown species in the unexplored dense stocky forest region above 5000 feet elevation.

The study of my collection brought out very strongly the close relationship of the Sibuyan flora to that of the flora on the east coast of Luzon along the Pacific ocean, especially from Atimonan to Casiguran of Tayabas province.

Key to the sections.

A. Pseudo-hermaphrodite; male flowers with one stamen and a rudimentary pistil. Pseudo-hermaphrodite flowers and gall flowers in one set of receptacles; fertile female flowers in another set.

1. *Palaeomorphe.*

AA. Unisexual or asexual; male flowers without rudimentary pistils.

B. Male, gall and fertile female flowers on the same receptacles.
2. *Urostigma.*

BB. Flowers unisexual; male and gall flowers in one set of receptacles; fertile female flowers only in another set.

C. Flowers monandrous.

D. Usually unbranched palm-like shrubs.
3. *Pseudopalma.*

DD. Branched vines, shrubs or trees.

E. Receptacles axillary.
4. *Sycidium.*

EE. Receptacles mostly in fascicles from stem and branches.
5. *Covellia.*

CC. Flowers di-rarely triandrous.

D. Receptacles mostly axillary.
6. *Eusyce.*

DD. Receptacles mostly in fascicles from stem and branches.
7. *Neomorphe.*

1. PALAEOMORPHE.

Ficus pisifera Wall.

Field-note:—A weak strangling epiphyte, about 30 feet from the ground; stems several or few from the same root cluster, branched from near the base, 2 to 3 inches thick; wood odorless, tasteless, moderately hard, with fine yet evident concentric rings, yellowish white; bark smooth, yellowish and gray mottled; branches laxly spreading, the twigs suberect; leaves scattering, not numerous, horizontal, chartaceous, deep lucid green above, much paler beneath, tips recurved; figs dull purple, chiefly along the stem and branches, occasionally clustered in the leaf axils.

Represented by number 12232, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Inhabiting woody borders of cool airy places along the Patoo river at 750 feet, in moist gravelly soil of the river banks. Usually it grows nearer the ground. This the Sibuyan Visayan calls "Nonok."

2. UROSTIGMA.

Ficus similis Merr.

Field-note:—A middle sized erect tree; stem 45 feet high, 1.5 foot thick, more or less branched far below the middle; branches numerously rebranched, divaricate, the ascending tips relatively short; wood whitish, with plain concentric rings, quite hard and brittle, odorless and tasteless; bark mostly brown, smoothish or lenticelled; leaves chartaceous, mainly horizontal, flat or nearly so, deep green above, much paler or yellowish green beneath, from ascending yellowish brown petioles; figs suberect, arising from the uppermost leaf axils, upon 0.33 inch long green peduncles, subglobose, green with white spots, 0.5 to 0.75 inch across, flowers reddish.

Represented by number 12265, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

In moist gravelly soil of the wooded banks of the Patoo river at 750 feet.

So far chiefly known in the east Visayan region and along the east coast of Luzon as far north as Baler.

Ficus infectoria caulocarpa (Miq.) King.

Field-note:—A subscandent and strangling tree climber; stems numerously divided and densely interlaced, tightly surrounding its support, their ramifications grown together where intercepted; main branches widely spreading, numerously rebranched, the ultimate ones upwardy curved; wood sappy white, soft, without odor or taste, the fine concentric rings quite plain; bark grayish white, bluntly lenticelled, containing latex; leaves horizontal or descending, thinly coriaceous, somewhat paler green beneath, tips recurved and margins more or less wavy; petioles light or yellowish green as is also the midvein, brown at the base and at the top on the nether side; figs globose, green as the peduncles and minutely whitish spotted, with a dull brown umbilicus; bracts dark brown or at least so fringed or margined.

Represented by number 12454, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Collected in wet compact soil of woods near a limestone seacoast. "Nonok" is the Visayan name, yet that name is also applied to a strangling species of *Fagraea*.

Ficus indica Linn.

Field-note for 12386:—Apparently a young cleaver or strangling climber, upon a medium sized tree; stem 3 inches thick or thicker, 30 feet long, occasionally branched, terete, a few times winding about its host or support; bark smooth, yellowish gray, with little latex; soft wood sappy white, odorless and tasteless; branches divaricate, long, freely rebranched and horizontally spreading over the creek space; twigs lax, suberect; leaves coriaceous, horizontal, duller and darker green above, flat except the recurved apex; figs subglobose, dull orange red, umbilicus much deeper red, the bracts yellowish green, small, in sessile pairs from the leaf axils.

Represented by numbers 12386 and 12291, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Here as well as in other localities, this species is usually met on the wooded banks of creeks and rivers bordering the open airy space of the creek or river flat. The local Visayan name is "Nanok-bina-baya."

Ficus tinctoria Forst.

Field-note:—A subprostrate shrub or sprawling among thickets; stem several inches thick, solitary or sometimes 2 or 3-clustered, terete, branched from near the base, 10 to 15 feet high or long; main branches widely spreading, rather long, the ultimate suberect or relatively short and quite rigid; wood dingy white, odorless, distinctly sweet, quite tough; bark very strong and easily stripped, very smooth, conspicuously whitish; leaves ascending, rigidly chartaceous, nearly flat, somewhat recurved, shining green above, paler or yellowish green beneath; figs when mature light yellow, globose, 0.5 inch thick, soft, upon 0.33 inch long erect stalks.

Represented by number 12557, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Collected in turf soil near the coast. It is a seacoast plant

especially in limestone formation throughout the Visayan region northward to the Batanes islands.

The Formosan species *F. swinhoi King* is quite similar in general aspects and *F. mearnsii Merr.* clearly belongs in this same alliance.

Ficus magallanensis Elm. n. sp.

A stocky tree; trunk nearly 6 dm. through, ascending, 10 m. high, branched from below the middle; wood soft, whitish, without odor or taste, concentric rings quite conspicuous; bark smoothish, mottled, with latex; main branches widely spreading, numerously rebranched, forming a flattish crown; twigs suberect, yellowish gray, ringed. Leaves alternate, ascending or horizontal, shallowly folded upon the upper dull deep green surface, paler beneath, oblong, the larger blades 10 to 15 cm. long, 5 cm. wide across the middle, acute to acuminate, base obtuse or rounded, entire, blackish brown when dry and diciduous, glabrous; midvein conspicuous beneath; lateral nerves 9 to 11 pairs, whitish, oblique, tips obscurely united; reticulations scarcely evident; petiole also glabrous, 2.5 cm. long, fluted on the upper flattish side, leaving conspicuous scars; bud bract brown, well acuminate, 1.5 cm. long.

Receptacles in axillary pairs, obscurely triangular obovoid, hard, shining, smooth, 2.5 cm. long, pale green and beautifully spotted with pink, 1.75 cm. thick above the middle; peduncle stout, somewhat thickened at both ends, subterete, green, averaging 2.25 cm. long, terminated by 3 smooth rather broad bracts; the smooth umbilicus greenish white, the irregular inner ones rigid and deep reddish brown; flowers apparently male and gall or sterile female; male few, monandrous in the region of the umbilicus or more or less scattered, 3.5 mm. long; pedicel 2 mm. long, dark brown, at the base subtended by 3 to 5 slenderly acuminate involucral bracts averaging 2 mm. in length; the gamophyllous perianth 1.5 mm. long, enclosing the single anther, brown; anther curved, upon a nearly black connective, 0.75 mm. long; sterile pistillate ones upon shorter pedicels and with slenderly pointed gamophyllous perianths; ovary compressed, bearing a nearly terminal very slender 2 to 3 mm. long style.

Type specimen 12407, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Discovered in sandy soil of light woods near limestone outcroppings extending into Nipa swamps toward the barrio called Ipil. Rare!

Apparently nearest related to *F. chyrsolepis Miq.*

3. PSEUDOPALMA.

Ficus pseudopalma Blco. *F. palmifolia Usteri* Beitr. 127.

Represented by number 12557, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Collected in thickets of grass lands at 50 feet altitude. Very common from the seacoast up into the hills of northern Sibuyan and is the typical coarse species.

4. SYCIDIUM.

Ficus hauili Blco.

Field-note:—An erect or ascending shrub; stem 4 inches thick, 10 feet high, branched from below the middle; bark smooth, grayish white; branches spreading, quite numerously rebranched, tough; petioles scurfy brown, ascendingly curved; blades limp, deep green and usually folded upon the upper side, paler green beneath, the main nerves whitish; figs solitary or in axillary pairs, flattish globose, 0.75 inch across, more or less ridged especially toward the apex, densely covered with brownish white lenticels, hard, deep green toward the sunken umbilicus, whitish toward the base, upon stout triangular stalks less than 0.5 inch in length.

Represented by number 12450, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Throughout light woods near the seacoast and in thickets bordering small meadows. The natives on Sibuyan call it "Labuog."

Ficus angustissima Merr.

Field-note:—Lax shrub; stem 2 inches thick, 10 feet high, suberect, branched from below the middle; wood fairly hard and solid, with fine closely set concentric rings, white, without odor or taste; branches repeatedly rebranched, laxly spreading; bark smooth, yellowish gray or brown; leaves chartaceous, rough on both sides, flat and quite rigid, deep sublucid green on the upper surface, paler beneath; figs dark green, globose, 0.33 inch in diameter, also slightly scabrous, the flowers pale white or yellowish so, rather soft in texture, the small umbilical scales reddish, becoming very soft and red when fully ripe.

Represented by number 12418, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Not common on seepage cliffs along the Pauala river at 1500 feet altitude. Quite rare ! The Visayan call it "Lortis."

In the alliance with *F. irregularis Miq.* and *F. cumingii Miq.*, quite distinct from either especially from the latter.

Ficus ampelas Burm.

Field-note:—Low and widely spreading tree; stem 15 feet high or higher, 6 inches thick, branched from above the middle; branches long, spreading, freely rebranched all along, the ultimate ones slender and ascending; wood moderately soft, sweetish, odorless, dull white, with prominent concentric rings; bark brown, smoothish; leaves chartaceous, ascending, slightly recurved toward the apex, lucid deep green above, much paler beneath, the larger nerves whitish; figs 1 to 3-clustered in the leaf axils, upon ascending yellowish green peduncles which are usually bracteate at the middle, orange color with red umbilicus, made rough by small reddish lenticels, less than 0.5 inch in diameter, ultimately becoming soft and claret red.

Represented by number 12177, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Among dense shruberries mixed with light woods on a fertile hillside near the coast. The local Visayan name is "Bili" or "Pili."

It has affinity to *F. todayensis Elm.* which has larger leaves with different bases, and fruits two to three times as large.

Ficus terminalifolia Elm. n. sp.

Shrub, 3 m. high; stem 5 cm. thick, branched from below the middle; branches slender, freely rebranched, lax and somewhat drooping, the apical portion of the young twigs scabrid and brownish in the dry state, suberect; wood soft, white, without odor or taste; bark smooth, white or grayish white. Leaves ascending, spreading, shining on the upper folded side, a trifle paler green beneath, drying greenish, glabrous, similarly scabrous on both sides, mostly opposite and crowded at the ends of the branchlets, broadly lanceolate to oblongish, entire, the blades varying from 4 to 10 cm. long, from 1.5 to 3.5 cm. wide across the middle, acuminate, base obtusely rounded or merely obtuse, midvein yellowish, glabrous, quite prominent beneath; nerves in the larger leaves 7 to 9 on a side, ascending, the basal pair subparallel, tips arched and faintly united; reticulations coarse and relatively prominent; petiole finely scabrid, 1 cm. long, turning brownish; bud bracts sharply acuminate, brown and subglabrous or cinereous, 5 mm. long.

Respectacles clustered along the branchlets, green, flattish globose or obscurely ovoid, less than 1 cm. across, scabrously pulverulent, ultimately turning smooth, soft and reddish; peduncle slender, 3 mm. long, bearing at the upper end united bracts; umbilicus conically flattened, the numerous tips of the inner protruding scales reddish, the inner scales hyaline and firmly ciliate; inner surface of syconium hairy; flowers apparently sterile female or gall only, 2.5 mm. long; stipe 1 mm. long, surrounded by the perianth tube, strigose; segments 1.5 mm. long, hyaline, oblanceolate or linear, finely ciliate on the margins at least, splitting clear to the base into 5 segments; ovary somewhat compressed, shining, yellow, obovoidly ellipsoid, 1 mm. across; style lateral, white except the terminal dark reddish brown stigma, very finely ciliate.

Type specimen 12115, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered in fertile compact soil among shruberries bordering grassy glens at 500 feet altitude. Only a few shrubs were observed and it seems quite unlike its other Philippine allies.

Cuming's number 1944 is a narrow leafed form with prominent nerves nearly at right angles and usually with a pointed lobe at the base. There are in the Philippines at least two distinct species, the heterophyllous shrub bearing both the entire leaves and those with a pronounced lobe at the base which often becomes querciform; the other shrub bears only entire leaves. The figs in both cases are alike even though they vary considerably. It is certain that *F. cumingii Miq.* is identical with the older *F. ulmifolia Lam.*

Ficus sibuyanensis Elm. n. sp.

Erect shrub-like tree; stem 1.5 dm. thick, 7.5 m. high, with its main branches arising from below the middle; branches widely spreading and numerously rebranched; twigs ascending, terete, glabrous but harsh, dull brown; wood moderately hard, whitish, a trifle sweet, odorless, bark smoothish, conspicuously mottled. Leaves primarily ascending, with recurved tips, paler green beneath, midvein whitish, the two surfaces drying entirely different in color, less scabrid on the upper blackish and sublucid surface, copious, alternatingly scattered, glabrous on both sides, inequilateral, rhombic elliptic, apex abruptly obtuse to acute or acuminate, entire, obtuse at the slightly inequilateral base, 10 cm. long, fully one half as wide across the middle or a trifle above this; lateral nerves averaging 5 on each side of the prominent midvein, glabrous, ascendingly curved and interarching, the basal pair strongly ascending, all scabrous, dull greenish gray as is also the entire nether leaf surface; petioles scabrous, at least 5 mm. long, dull brown; bud bracts less than 5 mm. long, setaceously acuminate, subscabrous or with smooth brown sides.

Receptacles grouped in small cluster along the branchlets in the leaf scars or in pairs from the axils of the lowermost leaves, globose, 7.5 mm. in diameter, subscabrous and green or lemon yellow, smoother when ripe; peduncle slender, 3 to 5 mm. long, occasionally bracteolate; umbilicus rounded, barely raised above the syconium, the aperture imbricately crowded with reddish tips of the inner scales; the inner ones hyaline, with brown margins and very finely ciliate, irregular in shape which depends upon their respective place along the aperture and consequently

of their functions; flowers apparently only gall, although the male should be found; syconium densely hairy on the inner side; flowers 3 mm. long, upon a whitish 1.5 mm. long pedicel which is sparsely strigose, the base of which is surrounded by numerous long hairs; perianth nearly as long, hyaline with but faint brown margins, oblanceolate, glabrous, overarching the ovary; ovary ellipsoid, 1 mm. long, yellowish; style oblique, short, the lower one half yellowish brown, the curved apical portion dark red.

Type specimen 12236, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

This species inhabits rich soil of light woods or in shruberries of a flat near the Patoo river at 750 feet. "Bili" is the vernacular name in the Visayan dialect.

Its nearest match is *F. pedunculosa Miq.* but that species has large pubescent fruits and leaves of a rather different cut. Also related to *F. irisana Elm.* of the *Sycidium* section which in turn closely resembles *F. asperior Miq.*

5. COVELLIA.

Ficus satterthwaitei Elm.

Field-note:—A small tree; stem 8 inches thick, 20 feet high, branched from below the middle; wood moderately soft, conspicuously ringed, pale white, odorless and nearly tasteless; bark grayish white mottled, smoothish, with latex; main branches widely spreading, the ultimate ones numerous and forming a dense flattish crown; twigs suberect; leaves thinly coriaceous, horizontal or ascending, nearly flat, much lighter green beneath, greatly varying in size; figs in dense clusters, upon few to several inches long stoutly branched tubercles along the stem, flattish, 1.5 inch across, yellowish below the middle, greenish above, provided with brown lenticels; flowers reddish brown; peduncle yellowish brown, 1.5 cm. long, bearing at the apex 3 similarly colored bracts.

Represented by number 12263, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Collected in red soil with a gravelly subsoil along the wooded banks of the Patoo river at 750 feet. This the local Visayan calls "Talobog."

Not typical, the leaves are too short for their width.

Ficus repandifolia Elm.

Field-note for 12249:—Erect, middle sized tree; stem 6 inches thick, 20 feet high, branched above the middle; wood soft, sappy white, with fine concentric rings, slightly sour, odorless; bark smooth, grayish white mottled; main branches widely spreading, freely rebranched above the middle, twigs ascending and relatively short; leaves leathery, ascending, flat or only the tips recurved, deep velvety green above, much paler or yellowish green beneath; figs chiefly clustered upon short thick ligneous tubercles scattered along the main branches, 0.75 inch long, subglobose but with a more or less flattened apex and a constricted base, 0.5 inch across, green with very minute creamy white spots, quite hard; the flowers are pink or flesh red; the seeds are brown.

Represented by numbers 12249, 12523 and 12413, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April to May, 1910.

In moist gravelly soil of wooded banks along the creeks and larger rivers as well as along forested ridges at 750 to 1000 feet. Very common in our region. "Talobog" is the Visayan name given to this number; "Cama-hiwan" to number 12523 and "Uloy-catoy" to 12413.

Ficus heteropoda Miq. *F. decussata Warb.* in *Perkins'* Frag. Fl. Philip. 198, 1905. *F. anomala Merr.* in Philip. Journ. Sci. I, Suppl. III; 183, 1906.

Field-note:—A rather short erect tree; stem 6 inches thick, nearly 15 feet high, widely branched from the middle; wood pale white, rather soft, without odor or taste, its concentric rings prominent; main branches nearly horizontal, the branchlets suberect; bark smoothish, grayish white; leaves horizontal or descending, chartaceous, rough, folded upon the upper side, apex recurved, paler green beneath, diverse in size; figs upon short tubercles from the stem, flattish globose, 0.5 to 0.75 inch

across, ultimately turning yellow and becoming soft, smooth and deep wine red; umbilical scales deep red even in the green fruits, flowers also reddish.

Represented by number 12403, *Elmer*, Magallanes, (Mt. Giting-giting), Sibuyan, May, 1910.

In dry grass lands of open more or less thicketed at flats 500 feet elevation. Nowhere common in the Philippines yet widely distributed. The natives call it also "Talobog."

Dr. Warburg writes of his *F. blepharostoma* as differing from *F. heteropoda Miq.* in the alternate leaves and axillary receptacles. Of his *F. decussata* he says that it has the habit of *F. hispida Miq.* Yet the facts are exactly reversed. Namely, *F. blepharostoma Warb.* is allied to *F. hispida Miq.*, while *F. decussata Warb.* is quite the same as *F. heteropoda Miq.* under the section of *Covellia*.

6. EUSYCE.

Ficus paloensis Elm.

Field-note:—A small erect tree; stem 7 inches thick, 20 feet high; branching mainly at the top, forming a flattish crown, widely spreading, the ultimate ones suberect; wood whitish, odorless, slightly sweet, very pulpy or soft; bark smooth, grayish white mottled, that on the branchlets brownish, full of latex; leaves horizontal, shallowly folded and slightly recurved, deeper green above, submembranous; figs usually in pairs from the leaf axils or in the axil of their scars, 0.75 inch long, ovoidly ellipsoid, yellow, after heavy rains the mature ones split open from apex toward the base into few to several rather regular carpellary divisions.

Represented by number 12559, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

In dry humus covered soil of a wooded ridge at 750 feet altitude or higher. "Talobog" is the native name.

Only sparingly known from the middle or the central Visayan region.

Ficus luzonensis imberbis Elm. n. var.

Small erect tree; stem 3 dm. thick, 10 m. high, its main branches arising from the middle; wood quite soft, dirty white darker in the center, with prominent concentric rings, odorless and tasteless; bark smoothish, grayish white, mottled, with latex; branches freely rebranched, widely spreading; twigs suberect, in subwhorls, the lower ones slenderer and giving rise to new ones, the younger ones brown and glabrous; bud bract 1 cm. long, acuminate, glabrous or at most puberulous, brown. Leaves alternate or subopposite, elliptic to subpandurately oblong, ascending, flat, subchartaceous, much deeper green above, turning brown while drying, entire, the blades 6 to 9 cm. long, 2.5 to 3.5 cm. wide across the middle, obtuse or rounded at the apex, base truncately rounded, alternate or subpandurate, glabrous on both sides; midvein reddish brown when dry, conspicuous beneath; nerves similar in color and prominence, 5 to 7 on each side, the basal pair arising from near the base and parallel with the margin, the upper nerves divaricate with ends uniting and forming an intramarginal line; reticulations fine yet evident; petiole nearly 2 cm. long, glabrous, green and caniculate along the upper side, finely scurfy brown along the lower.

Receptacles solitary or in pairs from the lowermost leaf axils, globosely flattened, 1.33 cm. broad, nearly as long, greenish yellow, when mature reddish streaked especially the upper one half, stipitate at the base, smooth, glabrous; peduncles slender, glabrous, 3 cm. long, tribracteate at the distal ends or about 3 mm. beneath the syconium proper; umbilicus nipple shaped, circular, relatively large, the aperture covered over by flat puberulent scales; the inner ones numerous, broad and irregular; flowers male and gall only; male flowers mostly in the upper one half of the syconium, 2.5 mm. long; the slender pedicel 1.25 mm. long, yellowish brown; perianth attached below the stamens, free, 1.5 mm. long, deep reddish brown, 3 or 4, acutely pointed, folded upon the upper side; anthers di or triandrous, upon short stalks, nearly 1 mm. long, curved, oblong, notched at the blunt ends, dorsifixed; gall flowers upon shorter pedicels, with longer and more sharply pointed perianth segments; gall ovary straw brown, shining, obliquely ellipsoid, 1 mm. long, terminated by a mere vestige of a style.

Type specimens 12319 and 12128, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March and April respectively, 1910.

In moist clay with a stony subsoil in woods at 750 to 1000 feet altitude, along the Sinuban creek and Pauala river.

Differing chiefly from typical *F. luzonensis Merr.* in being glabrous. The specimen by *Padre F. Sanchez* in the Herbarium Ateneo de Manila is most nearly like ours.

7. NEOMORPHE.

Ficus integrifolia Elm.

Field-note:—Large tree; stem 2.5 feet thick, 50 feet high or higher, more or less branched from far below the middle; wood rather soft, concentrically ringed, odorless and tasteless; bark yellowish gray, smooth or lenticelled; branches spreading, amply rebranched, the suberect twigs comparatively short; petioles ascending, scurfy russet brown; leaves leathery or subchartaceous, horizontal or descending, shallowly folded upon the upper much deeper green surface, with strongly recurved tips; figs upon few inches long ligneous and branched tubercles, scattered along the trunk mainly, short obovoid, deep red, 0.5 inch across; peduncles reddish, 1 inch long, 3-bracteate at the middle.

Represented by number 12267, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Collected in red moist soil with a gravelly subsoil on wooded benches along the Patoo river at 750 feet. "Dolalog" is the vernacular Visayan name.

Ficus latsoni Elm.

Field-note:—Erect tree; stem 1 foot thick, 25 feet high; main branches arising from the middle or below it, ascending, the ultimate ones widely spreading; wood soft, whitish, odorless, with a distinct sweet taste, the concentric rings coarse; bark smooth, cinnamon brown, occasionally becoming conspicuously white blotched when old, 1 inch thick, latex copious; twigs

very limp, suberect, green toward the ends; petioles yellowish brown; blades coriaceous, horizontal or descending, folded upon the upper side, much paler green beneath, the nerves greenish white; figs in small clusters along the branches, upon short tubercles and upon green and pendulous stalks, 0.75 inch across, short obovoid, smooth, apex sunken, light green or turning yellowish when mature, florets brown.

Represented by number 12473, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Found in compact red soil of light woods bordering grass lands at 750 feet altitude. "Duoyog" is the local Visayan name.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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PALAWAN RUBIACEAE

By

A. D. E. Elmer

ANTIRRHOEA Comm.

Antirrhoea philippinenses (Benth.) Rolfe.

Field-note:—Shrubs; stem few inches thick, subterete, 10 to 15 feet high, branched from below the middle; wood hard, heavy, odorless and tasteless, dingy white or brownish in the center; bark thin, yellowish except the rather smooth and gray epidermis; branches spreading, finely and laxly rebranched; leaves membranous, nearly flat and with recurved tips, a trifle paler beneath; flowers subpendant; corolla green as the calyx but in full anthesis turning yellowish or even orange red; fruit juicy, obscurely angular and with roundly truncate ends, 0.33 inch long, deep purple.

Represented by number 13237, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Gathered from seepage ledges along the wooded flanks of the Iwahig river at 1000 feet.

Not quite typical, for the leaves are fewer nerved and less hairy beneath.

Antirrhoea livida Elm. n. sp.

A shrub; stem 7.5 cm. thick, 3 to 5 m. high, its ascending

main branches from below the middle; wood solid, hard, nearly cremeus, odorless, bitterish, scaling in very thin plates or smooth and with a green hypodermis; branches ultimately numerously rebranched, widely spreading, the suberect twigs very lax, the young portion olivaceusly bristly. Leaves exceedingly variable in size, chiefly clustered at the ends of the branchlets, opposite, rotately or horizontally spreading, soft membranous, deeper green above, greenish brown when dry, the very short obtuse tips recurved, otherwise flat or nearly so, base obtusely rounded or subtruncate, the smaller leaves oblong, the larger ones rotund, hairy especially beneath, the larger blades 1 dm. long by 6 cm. wide across the middle; midvein prominent beneath, soft and densely pubescent; lateral pairs very oblique, their strongly curved tips more or less united, similarly pubescent, cross bars and reticulations faint yet evident; petiole 5 to 7.5 mm. long, pubescent; stipules 1.25 cm. long, soft hairy, setaceously acuminate. Inflorescence axillary, ascending upon 1 to 3 cm. long very slender olivaceus peduncles; flowers usually 3-clustered at the ends, the middle or central flower sessile, the lateral ones pedicellate, subtended by bristly hair-like bracts; calyx soft pubescent, 5 mm. long, the basal portion obscurely constricted and bristly hairy; the 4 teeth sharply acuminate, also pubescent on the outer side, subpersistent; corolla ochraceus, appressed pubescent on the outside, tubular, gradually narrowed toward the base, terete, nearly 1 cm. long; lobes 4, ovately obtuse, 2 mm. long or less, glabrous on the upper side; stamens 4, included just below the throat, filaments glabrous and very short; anthers 2.25 mm. long, linear, rounded at their ends; style terete, glabrous, the stigmatic portion forked; fruits usually solitary from the distal ends of the very slender and olivaceus peduncles, sessile, 1.5 cm. long at least, bristly in the young state, when old nearly glabrous, shining lividus, juicy, angular, truncately rounded at both ends, subtended by the persistent bracts; calyx also persistent with its teeth or lacinae, 7.5 mm. across.

Type specimen 12968, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In shallow red soil overlaid on a sheet of gravel stones in humid woods or forests at 250 feet.

This number is at once distinguished from 13237 or the preceding species which I allow to pass as *A. philippinensis* (*Benth.*)

Rolfe. This new species has exactly the same leaves as my *A. benguetensis* but its drupes are twice as long and distinctly angular. Again, the drupes of number 12968 are the same as on my *Timonius attenuatus* but the leaves are very different. Our Javan specimens of *T. hirsutiusculus Burck* have very short fruits and there still remains a question whether my long fruited *T. attenuatus* can be referred to *Burck's* species, despite the apparent similarity of their leaves.

DIPLOSPORA DC.

Diplospora sessile Elm n. sp.

Strict, erect shrubs; stem terete, 2.5 cm. thick, 3 m. high, occasionally branched toward the top; wood dingy white, quite hard, without odor or taste; bark dull gray or brown, thin, relatively deeply checked longitudinally; main branches suberect, numerously rebranched toward the distal ends; twigs comparatively short, angular and subcompressed, grayish white, glabrous, thickened at the leaf scars. Leaves opposite, copiously scattered along the numerous branchlets, 1 to 2 cm. apart, sessile, strictly ascending, flat, rigidly coriaceous, very smooth on both sides, lucid, paler green beneath, curing brown, cordately ovate, apex obtuse, 3 to 4 cm. long, averaging 2 cm. wide across the middle or a trifle below it, entire; midvein quite conspicuous beneath toward the base; the lateral pairs 5 to 7, oblique, very obscure, reticulately forked at their ends, reticulations obsolete; petioles very thick and only the length of the sinus; stipule glabrous, caducous, rigid, brown, acuminately triangular, 4 mm. long. Inflorescence erect, axillary, 3-flowered, upon short stout bracteate peduncle; interaxillary bracts glabrous, rigid, close to the stem, bristly hairy at the base on the near side, 6 mm. long, 4 mm. wide across the bars, the upper one half acuminate and folded on the ventral side; flowers subsessile or upon short thick stalks, subtended by a pair of bracts which are of diverse sizes and finely ciliate along the edges; calyx turbinate, pulverulent, 3 mm. long, the upper one third terminated into 4 sharply acuminate segments; buds imbricate, slightly twisted from left to right, 3 to 4 mm. long, thick and tubular below the middle,

glabrous except the pubescent throat; segments 4, ultimately spreading and recurved, oblong, obtusely rounded at the apex, splitting two thirds down from the apex; stamens 4, inserted upon the throat, alternating with the segments, upon short glabrous filaments; anthers 0.75 mm. long, ovate, basifixed, sharply acute, emarginate at base; style 2 mm. long, hairy except at the base, the upper one half divided into 2 stigmatic lobes; fruit erect, glabrous, subellipsoid, ruber red, 7.5 mm. long, with few to several seeds imbedded in the rather juicy white meat; seeds brown, appearing striate or shredded, compressed, more or less elliptic, apparently attached to a membranous-like central placenta.

Type specimen 13139, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This fine species was discovered along a gravelly stream bed coursing through a wooded flat at 500 feet altitude, between the two main forks of the Iwahig river. Common in this sitio, otherwise not seen.

GARDENIA Linn.

Gardenia merrillii Elm.

Field-note:—Erect shrub; stems strict, several in the cluster, 1 inch thick, 5 to 9 feet high, terete, only sparingly branched toward the top; wood odorless and tasteless, moderately solid, pith quite large, dingy white; bark grayish brown, minutely checked, yellowish except the epidermis; twigs green, divaricate, lax, relatively short; leaves coriaceous, horizontal, shallowly folded, paler green beneath, margins coarsely wavy; flowers strongly fragrant, erect, white especially the segments, calyx always green; fruit also erect, globose, smooth, hard, green and densely streaked with chocolate brown, when nearly ripe turning yellowish and become nearly 2 inches in diameter, each of the halves with more than several seeds.

Represented by number 13126, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered in dry compact stony soil of open shrubberies or light woods at 50 feet. This is a handsome species, both in

the flowering and fruiting states. It can be trimmed to become most any shape of an erect shrub and in favorable places it assumes a subscandent habit. The altitudinal range at which it thrives is considerable and it is known to extend from the west central Visayan region through Palawan into Borneo.

Gardenia glutinosa Zoll.

Field-note:—A middle sized tree; stem subterete, nearly 2 feet thick, somewhat crooked, 40 feet high, mostly branched toward the top; wood moderately hard, without odor or taste, stramineus white throughout; bark smooth, yellowish gray on the outside, dull cremeus otherwise, with a green hypodermis; main branches spreading, numerously rebranched, forming a dense flattish crown; twigs short, suberect, the young portion waxy covered; leaves crowded, ascending, submembranous, deeply curved upon the upper side, much paler beneath, the veins whitish, tips recurved; flowers erect, solitary, terminal, the calyx boot green; corolla 6 inches long, the tube pale yellow, the spreading segments creamy white at first, flavus when old; fruit erect, subglobose, nearly 2 inches in diameter; stamens and pistil pale white, not turning yellow with age but soon undergoing decay, the stigma very large and succulent.

Represented by number 13064, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Only one tree was found in humid fertile forests at 750 feet along the trail to Napsan.

This is to be carefully examined with my number 12670 from Sibuyan island and which I distributed as *G. longiflora Vid.* Our Palawan plant appears different and may be true *Zollinger's* species.

Gardenia segmenta Elm. n. sp.

Small and erect tree; stem 1.5 dm. thick, 7 m. high, mostly branched from above the middle; wood soft, dingy or sappy white, odorless but with a distinct bitter taste; bark yellowish gray and smooth on the outside, white on the inner side; main branches spreading, numerously and crookedly rebranched, the

slender ultimate ones with glabrate and suberect tips. Leaves submembranous, opposite, 1 to 3 pairs at the ends of the branchlets, horizontal, the abrupt sharply acuminate tips recurved, much paler green beneath, glabrous, drying green though unequally so on the 2 sides, obovately oblong or broadly oblanceolate, entire, base slenderly cuneate, blades 17.5 cm. long by 6 cm. wide above the middle; midvein whitish in the fresh state, conspicuously raised beneath, grooved on the upper side; lateral nerves 14 to 19 pairs, parallel, oblique, tips curved and gradually disappearing, also prominent, glabrous, cross bars very faint; petiole 1 cm. long or longer, pulverulent especially along the lower side; stipule brown, thin, caducous, at least 1 cm. long, oblong, grayish hairy on the inner side toward the base, otherwise glabrous, obtusely pointed. Flowers usually solitary, terminal, suberect, subtended by bracts, subsessile; calyx pale or light green, 4.5 cm. long, glabrous, the basal 1 cm. subcompressed and somewhat tapering toward the base, the middle portion strongly carinate or winged and extended into the 5 segments; segments green, finely nerved, linearly oblong, 4 mm. wide, 2 cm. long, subfalcate and acute toward the apex, occasionally with blunt dwarfed intermixed appendages or lobes; corolla tube creamy white, 6 cm. long, 6 mm. thick, subglabrate; lobes in the bud strongly imbricated and twisted from right to left, similar in color but soon turning deeper yellow, averaging 9, much narrowed and unequal at the base, oblong, 5 cm. long by 1.5 cm. wide across the middle, deflexed; stamens as many as there are corolla segments, inserted upon the glabrous throat, linear, 1.5 cm. long, obtuse at apex, striate and more or less twisted, upon short and glabrous filaments, alternating with the segments; style 1.25 mm. thick, terete, glabrous especially the basal portion; ovary imbedded, bearing a thick more or less rugose glabrous dark brown rim; ovules very numerous, arranged upon 5 linear placentae.

Type specimen 13153, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered in gravelly soil of a moist forested flat at 500 feet near the Iwahig river.

It differs particularly from *G. barnesii Merr.* in the calyx and from *G. pseudosidium Blco.* in the corolla segments. There are other minor differences.

HEDYOTIS Linn.

Hedyotis perhispida Elm. n. comb. *Lasianthus hispidus Elm.* Leaf. Philip. Bot. I; 10, 1906.

Field-note:—Harsh or very scabrous suffrutescent undershrubs or perennial herbs; stem single or few to several from the same root, flexible, terete, greenish, freely rebranched from the middle; the branches also slender, spreading and resting upon other herbaceous or ligneous plants; leaves scabrid, flat, chartaceous, paler beneath; inflorescence very short, ultimately dichotemously branched and divaricately disposed, spreading, dull green except the small yellowish white corolla; infrutescence short, loosely paniculate or cymose; valves ellipsoid, 3 mm. long, hispid, terminated by the 4 persistent acuminate calyx teeth, 2-celled; the valves or cocci 3 to 5-carinate on the dorsal side, flat on the ventral side, 2 mm. long, obovoidly ellipsoid, short pointed at the base, rounded at the apex, the ventral side open along the medium line; seeds rugose, dark brown, 0.75 mm. across, 5 in each cell, imbedded in a somewhat fleshy membrane, subcompressed, irregularly rounded from the side view.

Represented by number 12735, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Very common in dry stony soil along gravelly creek beds or in other poor soil among herbaceous thickets of light wooded flats at 250 feet.

By the nature of the ripe fruit it belongs to *Hedyotis* rather than to *Lasianthus*, and since the specific name "hispida" has already been used in the former genus, the prefix "per" is applied for the sake of distinction at least.

Hedyotis pulgarensis Elm. n. sp.

An erect, laxly branched undershrub; branchlets terete, glabrous, green, slender. Leaves scattered all along, opposite, drying green on both sides, slightly paler beneath, glabrous, ascending, flat or only the slenderly acuminate tips recurved, quite variable in size, entire, acute or acuminate at base, lanceolate, the larger blades 1 dm. long by 1.75 cm. wide below the middle, membranous, frequently smaller especially toward the tips of the

branches; midvein conspicuous beneath; the 3 to 5 lateral nerves very obscure from both sides, ascending, tips usually united one third distance from the margin, reticulations none; petiole less than 1 cm. long, very slender and glabrous; stipule also glabrous, 7.5 mm. long, broad at the base, acuminately pointed, the sides but especially the apex pectinate. Inflorescence glomerated in the uppermost leaf axils, the fruits in the lower leaf axils; calyx gradually widening from the base upward, glabrous, pale whitish except the greenish tipped calyx segments, nearly 3 mm. long; teeth acute, 4, strict, 1.25 mm. long; corolla white, hyaline below the middle in the dry state, otherwise drying brownish, narrowest toward the base, 5 mm. long, glabrous except the few whitish hairs in the regions of the throat inside; segments 4, ovately obtuse, 1.5 mm. long or a trifle longer, rotately spreading and ultimately recurved; stamens 4, upon the throat and alternating with the segments; filaments very slender, 1 mm. long, glabrous; anthers basifixed, linearly oblong, ends blunt, 0.75 mm. long; style slender, glabrous, scarcely as long as the tube, whitish when dry; stigma lobes brown, short, blunt, pulverulent or puberulent; fruit 5 mm. long, elliptically elongated, terete, greenish especially the persistent nearly 2 mm. long calyx teeth; the 2 halves plano convex, opened along the medium horizontal region, crustaceous; seeds in each cell or half black, irregular in shape, angularly compressed, 1 mm. across.

Type specimen 13212, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This low *Hedyotis* adorns the path along a heavily forested ridge at 3000 feet altitude.

Its leaves are entirely too slender to be classed with *H. magallanensis Elm.*

Hedyotis kingiana Elm. n. sp.

A suffrutescent scrambler; stems inclined to twine, terete, tough, 7.5 cm. thick, yellowish brown, green and subolivaceus pubescent on the younger portion, divaricately branched all along, the ultimate ones relatively short and suberect. Leaves copious, submembranous, ascending, only slightly folded upon the darker green pulverulent upper side toward the base, beneath short but soft pubescent, green when dry, those at the distal ends

usually smaller, the larger blades 5 cm. long by 3 cm. wide below the middle, edges entire, gradually tapering to the acute to acuminate apex, base broadly rounded or subcordate; petiole 5 mm. long more or less, densely hairy; midvein densely pubescent especially toward the petiole; lateral nerves 3 or 4 on each side, only 2 in the small blades, strongly curved and ascending, the basal 2 or 3 pairs arising from below the middle, the uppermost pair arising from the middle, reticulations none; stipule similarly pubescent, 4 mm. long, very broad, the middle portion extended into a few pubescent bristles. Inflorescence green except the darker green calyx segments, olivaceus pubescent in the dry state, paniculately corymbose, 3 to 5 and even 8 cm. long, branched from above the middle; peduncles strict, 1 to 3 cm. long, usually 3; pedicles of the capitulae also strict, the lateral ones at right angles and 5 mm. long, subtended by hairy foliaceous bracts less than themselves in length; flower heads subglobose, 7.5 mm. in diameter, severally flowered, the fruiting heads scarcely larger; calyx campanulate, 3 mm. long, pubescent on the outside, glabrous within, hyaline toward the base, bearing 4 rather linear green teeth one half as long; corolla creamy white, 5 or more mm. long; segments 4, united only for the basal 1 mm., 3-veined, glabrous on the outside, heavily bearded along the midvein on the upper side below the middle, linearly oblong, obtusely rounded at the apex, ultimately strongly recurved upon the underside, the short tube glabrous; stamens also 4, alternating with the petals and inserted upon the throat; filaments 2 mm. long, subcompressed, brown, glabrous except the densely bearded ventral middle side; anthers 1 mm. long, linearly oblong, with rounded ends; style strict, glabrous, as long as the corolla, stigma lobes curvingly divergent, thick, blackish, papillose on the stigmatic surface, 1 mm. long.

Type specimen 12716, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Found sprawling over thickets composed of coarse grasses, sedges and low shrubs in dry hot sterile soil of hillocks at 500 feet. Dedicated to *Sir George King*, an eminent English botanist.

This species is very near to *H. prainiana King* and I have considered it as that in my first article. Recent study of more material revealed a number of specific differences.

IXORA Linn.

Ixora palawanensis Merr.

Field-note:—Lax and erect undershrub; stem terete, 0.5 inch thick, occasionally branched from near the ground, only sparingly rebranched toward the top; wood moderately soft and dirty white, without taste or odor; bark smooth, brown; leaves scattered along the branchlets which are usually recurved, flat, coriaceous, dark green except the lighter lower surface, the young leaves pale green; inflorescence terminal, erect or suberect, the stalks ruber, the bracts greenish, the corolla tube similar in color, the 4 rotate or descending segments miniatus, the stigma with an exerted portion of the style purple; fruits red.

Represented by number 12821, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Here and there scattered in either gravelly or other good soil of light wooded flats at 750 feet.

Ixora intermedia Elm. n. sp.

A slender erect tree; stem subterete, 7.5 cm. thick, 7 m. high, crooked, branched from below the middle; wood hard and heavy, odorless and tasteless, dingy yellowish white, the outer portion lighter than the darker central mass; bark testaceus except the nearly smooth yellowish gray epidermis; branches divaricately spreading, slender, freely rebranched, the ultimate ones glabrous. Leaves opposite, subcoriaceous, also glabrous, lighter green beneath, nearly flat, horizontally spreading, 1 to 3-clustered toward the end of the branchlets, dissimilar brown in the dry state, very unequal in size, oblong, the larger blades 2 dm. long by 7.5 cm. wide across the middle, gradually tapering to the acute apex and base, entire; midvein stout, the 9 to 11 ascendingly curved lateral pairs with tips more or less archingly united, reticulations coarse and quite evident; stipule glabrous, broadly ovate, the median line projecting into an acute point, 5 mm. broad, scarcely longer; petiole 1 cm. long, grooved on the upper side, also glabrous, stout; infrutescence always terminal; peduncles strict, green, usually 3, divaricately spreading, subglabrous, subtended by stipular bracts, 7.5 cm. long; main branches

1 to 3 cm. long, from above the middle, similarly spreading, subtended by involucral bracts, secondary branches similar; flowers congested, short pedicelled; calyx 2 mm. long, ellipsoid, glabrous, toothed, green but turning light pink; fruits pale white, subglobose or obscurely compressed, 7.5 mm. across, when ripe reddish; the 2 stone-like seeds rugulose on the dorsal side, concave on the ventral, circular, 6 mm. across, centrally attached.

Type specimen 12957, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in stony soil of dense woods along a dry stream bed at about 50 feet altitude.

Intermediate between *I. barbata Roxb.* and *I. cumingiana Vid.*

Ixora leucocarpa Elm. n. sp.

Suberect shrub; stem terete, 2.5 cm. thick, 1 to 3 m. high or even higher, only very sparingly branched from the middle; the thin sapwood watery white, otherwise whitish, quite hard, closely grained, without odor or taste; bark smooth, dull brown, castaneus beneath the epidermis; branches sparse, crooked. Leaves opposite, few pairs scattered or frequently with only a pair, diverse in size, chiefly at the ends of the glabrous twigs, descending, rigid and thickly coriaceous, only a trifle recurved toward the acute or roundly obtuse apex, base cuneate, glabrous, deep green above, much paler so beneath, curing unequally dull brown, the entire margins minutely involute when dry, the larger blades 2 dm. long by 8 cm. wide above the middle, obovately oblong or the smaller ones oblanceolate; midvein caniculate above, conspicuously raised beneath; lateral nerves 5 to 7 or even 9, divaricate, comparatively very obscure, their tips archingly united 5 mm. from the margin, equally visible from the upper side, reticulations obsolete; petiole very stout, 1 to 1.5 cm. long, glabrous, when old becoming scurfy. Infrutescence terminal, always erect, solitary, 3 to 5 cm. long, peduncle 2 to 3 cm. long, glabrous, subtended at the base by 2 pairs of unequal bracts; the larger pair of bracts oblong and 7.5 mm. long, the smaller pair 5 mm. long, broadly ovate and sharply pointed, all glabrous; branches from the top only, short yet freely rebranched, spreading, forming a condensed 2 to 3 cm. thick infrutescence;

calyx nearly 3 mm. long, glabrous, toothed, campanulate, upon short ebracteolate pedicels; corolla pure white, 1 cm. long; fruits compressed globose, less than 1.25 cm. through, bearing the minute persistent calyx, chalky white at all stages; seeds 2, circular, centrally attached, concave on the ventral, convex on the dorsal side.

Type specimen 12894, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This *Ixora* with white flowers and fruits is quite commonly scattered in loose fertile soil or in a kind of adobe flat of woodlands or in humid forests from 250 to 1000 feet.

Quite distinct from *I. crassifolia Merr.* though related to it.

Ixora filmeri Elm. n. sp.

Erect undershrub; stem 5 cm. thick, 3 m. high, mainly branched from above the middle; branches lax and flexible, freely rebranched, glabrous, gnarly at the point of branching; wood brownish white, rather tough, odorless and without taste; bark smooth, brown. Leaves opposite, scattered along the twigs, glabrous, drying dull brown, quite variable in size, the average blades 1 dm. long by 4.5 cm. wide across the middle, obovately oblong or merely oblong, apex obtuse, base obtusely rounded, entire, horizontal, flat, thinly coriaceous, darker green above, the young ones pale; midvein prominent beneath, grooved above, reddish brown when dry; lateral nerves 9 to 11 pairs and relatively obscure, equally visible from the upper side, alternating with rather prominent secondary ones, divaricate, straight, interarchingly united, reticulations quite prominent from both sides; petiole 3 mm. long, stout, glabrous; stipule 3 to 5 mm. thick, broadly ovate, with a carinate and slenderly acuminate point. Peduncle from 2 to 5 cm. long, slender, glabrous, erect or ascending, terminal or from short specialized lateral branches, subtended by a whorl of imbricated sharply acuminate bracts which themselves are frequently subtended by a pair of foliaceous bracts; inflorescence umbellately cymose, spreading, 3 to 4 cm. across; branches and pedicels short, subtended by very slender bracteoles; calyx cup shaped, 1.5 mm. long, glabrous, rim entire or occasionally apiculate; corolla varying from 1 to 2 cm. in length, wholly glabrous; tube slender, green except the

middle atropurpureus portion; segments white, 5 mm. long, oblongish elliptic, imbricate in the bud state, rotately spreading or even reflexed in anthesis, 4; stamens of the same number, alternating with the calyx segments, upon the throat, subsessile or usually upon 1 mm. long glabrous filaments; anthers yellowish white, 4 mm. long, lanceolately linear, sagittate at the base, the emptied cells folded and more or less twisted, basifixed, verticellately spreading; style slender, also atropurpureus, glabrous; stigma of 2 recurved flattened fleshy forks, little exceeding the corolla; ovary glabrous, well inbedded in the calyx, fruits ovoidly compressed, about 1 cm. long, 2-celled; its white meat juicy, glabrous, green but when exposed turning bright or light atropurpureus; seeds 2, circular, centrally attached on the hollowed ventral side, convex on the dorsal.

Type specimen 12719, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

This species was found to be rather common in the sand gravelly soil of woods along the seacoast. I take pleasure in naming it after *Mr. E. L. Filmer*, assistant governor of Palawan and at that time stationed at Brooks Point.

It approaches most closely to *I. philippinensis Merr.* but specifically distinct.

LASIANTHUS Jack.

Lasianthus obliquinervis Merr.

Field-note:—A suberect laxly branched undershrub in moist fertile humus covered soil of dense forests at 1000 feet altitude.

Represented by number 13252, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

MORINDA Linn.

Morinda philippinensis Elm.

Field-note:—Scandent and sprawling; stem terete, made rough by very coarse excrescences, crooked, 1 inch thick; wood

very soft, bendable, flavus, divided into several radial divisions, porous, sweetish, odorless, the yellow portions divided by the sappy white sapwood; bark brown to gray, lenticelled or excrescent; branchlets numerous, forming dense interlaced masses at the top, the slenderer ones drooping; leaves descending, thinly coriaceous, strongly folded upon the upper slightly greener surface; heads ascending, 1 to 3-clustered, verticellately spreading, green as the peduncles; the odorless flowers also green except the whitish hairs, caducous, the florescent heads less than 0.5 inch in diameter; the immature fruits again as large, solid, yellowish on the inside; mature heads nearly 2 inches in diameter, yellowish.

Represented by number 12928, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Very common in thickets and light woods of flats along the Iwahig river at 250 feet.

Morinda bartlingii Elm. n. sp.

Twining and sprawling over thickets, forming more or less tangled masses; stem terete, brown, nearly 5 mm. thick, scatteringly branched, very flexible; branchlets usually in pairs, short, erect, leaf bearing, glabrous except the ultimate ascendingly curved tips; twigs roughened by the prominent leaf scars. Leaves opposite, scattered along the young twigs, terminally clustered in the old ones, diverse in size and shape, the young ones lanceolate, the mature ones obovately oblong, the larger blades 5 cm. long, 2 cm. wide above the middle, entire, ascendingly spreading, submembranous, usually concave on the upper darker green side, dull brown when dry, soft pubescent especially on the nether side, apex rounded and merely apiculate, attenuate or cuneate toward the base; midvein evident beneath especially toward the base, lateral nerves obsolete; petiole 5 mm. long or longer; stipules caducous, brown pubescent, membranous, 3 mm. long, broad, terminated by 2 very minute and slender points. Inflorescence terminal, upon 3 to 5 peduncles which in the fruiting state are softly hirsute, 5 to 7.5 mm. long, green; flowers sessilely clustered upon a pubescent somewhat thickened disk or receptacle, usually several in a head, greenish; calyx dark green, 3 mm. long, tubular, nearly 2 mm. thick, subglabrous

toward the truncate or scarcely 5-toothed rim; corolla angular in the bud state, green, subglabrous on the outside and on the inside of the tube toward the base, 5 mm. long, the upper two thirds divided into 4 or 5 oblongish segments; throat hairs whitish, profuse; segments with obtuse tips which are usually hardened, thickened and inflexed, ultimately recurved; filaments glabrous, slender, mostly adnate to the corolla tube, only 1 mm. free; anther, 1.5 mm. long, oblong, with rounded ends, subbasifixed; fruiting heads solid, easily separating from the persistent peduncles, irregularly or flatly globose, 1 cm. across, bearing few to several persistent calyx rims, puberulent especially toward the base, aurantiacus when mature.

Type specimen 13037, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Only once found in an open spot of forests at 50 feet altitude, in dry well drained and fertile soil among thickets of grasses and low shrubs. Named after the celebrated botanist, *Friedrich Gottlieb Bartling.*

It approaches *M. longifolia Bartl.*

MUSSAENDA Linn.

Mussaenda philippica Rich.

Field-note:—Quite a slender tree; stem 8 inches thick, 20 feet high, terete, crooked, branched from above the middle; wood moderately hard, odorless and without taste, dingy white; bark brown, densely lenticelled, pale umber except the epidermis; main branches ascending, freely rebranched; leaves ascending and strongly recurved, thinly coriaceous, deeply folded upon the darker green upper side; inflorescence erect, green as is also the calyx; corolla greenish on the outside, the segments on the outside with their tips very pale green, the upper side aurantiacus; the outer calyx segments of the outer flowers occasionally petaloid.

Represented by number 12792, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In dry compact soil of the cogon region bordering woods at 250 feet.

NAUCLEA Forst.

Nauclea purpurascens Korth.

Field-note for 13006:—A bushy tree; stem 2 feet thick, subterete, soon divided into few ascending main branches, 25 feet high or higher; wood hard, heavy, burly, dirty yellowish white or brown, odorless and tasteless; bark scaling, yellowish gray, isabellinus except the epidermis; branchlets numerous, rather lax, the latericius angular apical portion suberect; leaves horizontal or the older ones descending, nearly flat but margins irregularly wavy, much richer green on the upper side; heads 1 to 3, terminal, erect or nearly so; calyx cremeus and soon withering, thereby turning brown; the exerted style and capitate stigmas sulphureus; receptacle yellow; the flowers posses a slight disagreeable odor.

Represented by numbers 13006 and 12983, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

The first number cited grew in stony soil along the Iwahig river bank at 500 feet; the second number was collected in well drained soil of a steep wooded slope at 2000 feet altitude.

OLDENLANDIA Linn.

Oldenlandia paniculata Linn.

Field-note:—Stem perennial or only biennial, flexible, somewhat creeping at the base, branched and taking root at the joints, dark green, angled; leaves horizontally spreading, much lighter green beneath, flat, coriaceous; pedicels and calyx green, the other parts of the odorless flowers white; capsule somewhat angularly flattened.

Represented by number 13034, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In fine dry gravelly creek beds of dense woods at 50 feet altitude. Apparently introduced but not common.

OPHIORRHIZA Linn.

Ophiorrhiza pulgarensis Elm. n. sp.

Somewhat succulent herbs; stem one or more from the

same root cluster, terete, green, ascending, occasionally branched below the middle but usually toward the top, varying 1 dm. to 1 m. in height, base of stem ligneous; roots ample, fibrous; branches few, ascending, sparingly rebranched, crookedly virgate, latericius pubescent especially on the terminal or young portion. Leaves soft membranous, horizontally spreading, dark velvety green above, glaucus green beneath, pubescent especially on the lower surface, greatly varying in size, the normal blades 1 dm. long by 4.5 cm. wide across the middle or a trifle below it, oblong or ovately oblong, entire, obtuse or bluntly acute at apex, roundly obtuse at the base or subcuneate, oppositely scattered but usually crowded toward the top, light purple tinged in the dry state especially on the lower side; petiole 1 to 3 cm. long, latericius pubescent; midvein conspicuous from beneath, the 11 to 14 lateral pairs subparallel and ascendingly curved, reticulations obsolete; stipule pubescent, the broad basal portion 2.5 mm. long only, abruptly terminated by a 5 mm. long very slender point. Peduncle usually solitary, in the fruiting state 3 to 5 cm. long, erect, terminal, similarly pubescent, subtended by stipular bracts; branches at the top mostly, 3 to 5, circinately recurved, pale green except the pure white flowers, purplish tinged, all pubescent; pedicel hairy, about 2 to 3 mm. long, subtended by one or more unequal linear similarly hairy bracts; calyx ellipsoid, 3 mm. long, crisply pubescent, the upper one third composed of 5 linear hairy teeth; corolla 7 mm. long, sparsely pubescent on the outside except at the glabrous constricted base, the throat region on the inside densely woolly; segments 5, ovately obtuse, glabrous on the upper side, 2 mm. long; stamens normally 5, inserted upon the tube 1 mm. from the base, erect; filaments 0.5 mm. long, glabrous; anthers linearly oblong, with rounded ends, 1.25 mm. long, subbasifixed; ovary rim glabrous, otherwise enclosed by the calyx; style slender, glabrous, as long as the corolla, terminated by 2 short thick pulverulent lobes; capsule nearly 7.5 mm. wide, 3.5 mm. high, much flattened, ends rounded, dehiscing across the top and dividing into 2 valves, shining, smooth on the inner side, sparsely hirsute, the linear calyx segments still persistent; placentae 2, ascending, short clavate, distinctly pedicellate; seeds several to many on each plancenta, glabrous, irregularly angular, less than 0.5 mm. across, brown.

Type specimen 12949, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected it in moist soil of loose moss covered rocks near a stream at 1500 feet or becoming dwarfed plants in dry compact soil on forested ridges at about the same altitude.

In my first article on *Rubiaceae* page 22 of this publication, I keyed out *O. mungos Linn.* from the balance of our then known Philippine species by "Mature infrutescence and leaves usually staining red while drying." At that time it was suggested to me that the specimens turned red through the red stained poisoning liquid used. But all subsequent specimens of the above named species have also turned red. Furthermore, all the rest of our Philippine species in the herbarium have also been poisoned but without the red stain. These facts are verified in all herbaria having *Ophiorrhiza* collections. This new species also turns characteristically red while curing and certainly no staining liquid has yet been applied. In this mount Pulgar specimen I found the process of turning red 'while drying' exactly as I stated it in my key over five years ago. Apparently this same pubescent and reddish tinged plant extends southwards to Singapore.

PAVETTA Linn.

Pavetta palawanensis Elm. n. sp.

A slender shrub; stem 2.5 cm. thick, terete, 3 to 5 m. high, branched from below the middle; wood sappy white, rather hard or tough, without odor and taste; bark caesius, more or less mottled, its hypodermis green; branches few, lax, the young ascendingly curved twigs angular and avellaneus pubescent in the dry state. Leaves horizontally spreading, the abruptly acute or obtuse apex recurved, otherwise flat, coriaceous, much paler green on the finely pubescent nether side, the upper glabrous surface nearly black when dry, base cuneate, entire margins minutely involute, oblong or the smaller ones subelliptic, 17.5 cm. long excluding the stalk, 6.5 cm. wide across the middle or a trifle above it; midvein rather prominent beneath especially toward the base, the 5 to 7 main pairs of nerves ascendingly

curved, reticulations coarse and equally visible from both sides; petioles 1 to 2 cm. long, grooved along the upper side, similarly pubescent; stipule 5 to 8 mm. long, broad, acuminately pointed, scurfy brown or slightly hispid. Inflorescence terminal, erect, 1 to 3-clustered, 5 cm. long, branched from below the middle, subtended by stipular bracts; branches ascending, forming a corymbose panicle, all pubescent, the larger ones subtended by large bracts; the bracteoles subtending the short pedicels minute; calyx 3 mm. long, tubularly ellipsoid, nearly 2 mm. thick, subtended at the base by a pair of short hairy bracts, upon very short yet relatively thick pedicels, densely pubescent on the outside; calyx teeth obtusely oblong, 1 mm. long, glabrous on the inner side; corolla glabrous, the basal one third tubular, otherwise divided into 4 oblong segments, white; stamens also 4, upon the throat and alternating with the segments; filaments glabrous, less than 1 mm. long, compressed; anther linear, acute at apex, basifixed, sagittate, at least 5 mm. long, 0.75 mm. wide, more or less striate, recurved and verticellately spreading; style terete, 1 cm. long, finely pubescent in the region 1.5 mm. from the base, otherwise glabrous, gradually tapering toward the acuminate apex; ovary rim glabrous, well encased by the calyx, 2-celled, 1-ovuled in each.

Type specimen 12940, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in compact humus covered soil of a densely wooded flat at 250 feet.

Possibly nearest allied to *P. indica polyantha Hook.* and to *P. indica tomentosa Roxb.* In the Philippines there are several distinct specieswhich can easily be placed under the descriptions of the above named varieties.

PETUNGA DC.

Petunga racemosa (Roxb.) K. Sch.

Field-note:—Erect shrub; stem terete, 15 feet high, 3 inches thick, terete, crooked; wood dingy white, hard, heavy, odorless and tasteless; bark reddish brown, finely checked longitudinally; branches from above the middle, divaricate, 3 feet long, only

occasionally rebranched, terete, pale green; leaves descendingly recurved, folded upon the upper darker green surface, thinly coriaceus; the ascending young infrutescence nearly viridis green.

Represented by number 12756, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in black compact humus covered soil of a wooded flat at 250 feet altitude.

PLECTRONIA Linn.

Plectronia pedunculare (Cav.) Elm.

Field-note:—A shrub, 5 to 9 feet high; stem 1 to 3 inches thick, branched from below the middle; branches droopingly spreading; leaves flat, membranous, pale green; flowers pendant, white.

Represented by number 13247, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In deep fertile moist soil of lightly wooded flats or among shrubberies bordering stream courses at 50 feet altitude.

Plectronia didyma (Gaertn.) Elm.

Field-note for 12829:—Slender and ascending tree; stem 5 inches thick, terete, its main branches arising from the middle, 15 feet high or long; wood finely grained, melleus especially toward the center, odorless and tasteless, rather hard; bark grayish white, mottled, green beneath the smooth epidermis, whitish on the inner side; branchlets spreading, lax, their ultimate subangular tips ascendingly curved; leaves coriaceous, mostly horizontal, flat except the abruptly recurved apices, paler green beneath, shining dark green above; inflorescence axillary, green, the corolla and inner organs creamy white, sweetly fragrant.

Represented by numbers 12829 and 13180, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and May, 1911.

On a dry fertile well drained ridge at 1000 feet in woods festooned with climbing and sprawling bamboos. The last number cited was collected in red shallow soil with a gravelly subsoil along the wooded banks of the Iwahig river at 750 feet.

PSYCHOTRIA Linn.

Psychotria malayana Jack.

Field-note:—A slender erect shrub-like tree; stem 5 inches thick, subterete, 15 feet high or higher, branched from below the middle; wood soft or moderately so, dingy yellowish white, quite heavy, odorless, slightly sweet to taste; bark caesius, smooth, with a green hypodermis, the greater inner portion sappy white; main branches ascending, crooked, repeatedly branched at the top; twigs lax, suberect, the leaf bearing portion green; coriaceous leaves nearly horizontally spreading, lucid green on the shallowly folded upper surface, much paler green beneath; inflorescence erect and terminal, pale green except the pure white odorless and erect flowers.

Represented by number 12981, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered in red stony well drained soil of a wooded ridge at 2000 feet.

Psychotria manillensis Bartl.

Field-note:—A low erect and quite rigid suffrutescent perennial; stem terete, 0.33 inch thick, 1.5 foot high, tough or rather rigid, greenish, occasionally branched from the middle; leaves subglaucus green, a trifle deeper or brighter green beneath, chiefly horizontal, coriaceous, flat or only the tips recurved; infrutescence arising from the uppermost leaf axils, dark green, erect or on the lateral branches divaricate; fruits ovoidly ellipsoid, very dark green, terete, longitudinally striate, the bracts and persistent calyx also green; the smooth elongated ripe fruits shining vermillion red, ridged when dry.

Represented by number 12868, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Quite commonly scattered in rich moist humus covered soil of dense woods and forests at 500 feet or at a higher altitude.

Psychotria voluta Elm. n. sp.

A twining climber; stem volute, terete, 5 mm. thick, branched,

glabrous even the young leaf bearing tips. Leaves opposite, usually crowded toward the ends, glabrous, spreading, unequal in size, subcoriaceous, dull green when dry, entire margins involute, sublucid on the upper side, paler green beneath, rotundly oblong or obovately so, roundly obtuse at apex, base obtuse, the larger blades 7.5 cm. long by 3.5 cm. wide across the middle or a trifle above it; midvein dark brown on the nether side and prominent toward the base; main lateral nerves 5 to 7 on each side, obscure, ascending, slightly curved except their tips, more evident from the upper side, reticulations very obscure beneath and evident on the upper side; petioles at least 5 mm. long, glabrous; stipule brown, rim-like. Inflorescence 3 cm. long, erect, terminal, usually single, branched toward the top; peduncle very finely puberulent, subtended by minute bracts and a pair of small leaves, 2 cm. long; corymb 2 cm. across, all the branches subtended by rather sharply pointed bracts; flowers few clustered at the ultimate branchlets, subsessile, subtended by small bracteoles; calyx glabrate, turbinate, 2.5 mm. long, 5-toothed, green; corollas twice as long, whitish, also glabrate except the villose throat, tubular below the middle, 5-segmented above this; stamens 5, alternating with the segments and inserted upon the throat, their filaments short, anthers yellow; style equalling the corolla, glabrous, the 2 short stigmas pulverulent.

Type specimen 13253, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

It belongs to the ***P. serpens Linn.*** group.

Psychotria palawanensis Elm. n. sp.

Erect shrub; stem 2.5 cm. thick, 3 m. high, terete, crookedly branched from above the middle; wood dingy white, moderately hard, odorless, slightly bitter; bark thin, smooth, brown on the stem, gray on the branchlets; twigs suberect, glabrous. Leaves leathery, drying dull green, glabrous, obovately oblong or oblanceolate, the normal blades 17.5 cm. long by 7 cm. wide above the middle, quite variable in size, margins entire, apex abruptly acute to obtuse, base cuneate, opposite, usually at the ends of the twigs; midvein brown, conspicuous beneath, also glabrous; lateral pairs 12 to 16, straw brown, shining, ascendingly curved, subparallel, the tips interarching, reticulations very

coarse and obscure; petiole stout, 1 to 2 cm. long, glabrous. Infrutescence terminal, suberect, usually upon very short and thick peduncles, glabrous, green stalks becoming brown when dry; main branches 1.5 to 2 cm. long, several in a subwhorl, corymbosely spreading, strict, di or trichotemously branched above the middle, all the branches subtended by vestiges of bracts, more or less angular or subcompressed; drupes obovoidly ellipsoid, coal black when mature and upon becoming dry, 7.5 mm. long, obscurely striate, the persistent calyx rim minute, 5 mm. thick above the middle; pyrenes 2, plano convex, pointed toward the base, obscurely 3 to 5-ridged on the back.

Type specimen 12737, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In shallow humus covered soil underlaid with gravel stones of a slightly wooded flat at 250 feet altitude.

Ours approaches *P. plumeriaefolia Elm.*, yet distinct from number 3875 Forestry Bureau collection.

Psychotria repens Elm. n. sp.

A perennial prostrate suffrutescent creeper; stem terete, dark green, flexible, creeping below the humus, taking roots at the point of branching, only sparingly branched, 7.5 mm. thick, the distal ends ascending and leaf bearing, from 2 dm. to 2 m. long; branches short and erect or longer and ascending; roots blackish, fibrously branched, subligneous. Leaves horizontal or ascending from the base, shallowly recurved, coriaceous, deep green above with the veins marked by darker green regions, much paler green beneath, when dry nearly black on the upper glabrous side, grayish brown on the pulverulent nether surface, nearly flat, obovately oblong, 1 dm. long, 4 cm. wide above the middle, entire, apex short obtuse or acute, cuneately obtuse at base; midvein conspicuous beneath and brown scurfy or pulverulent; lateral pairs about 9, ascendingly curved, less pulverulent, cross bars and reticulations very obscure; petiole 5 mm. long, sparsely fuligineusly hairy; stipule 1 cm. long, similarly hairy, apex divided into 3 or more ciliate lacinae. Inflorescence terminal, 2.5 cm. long, fulvus pubescent; usually more than 1 peduncle, subtended by stipular bracts; flowers in small clusters toward the end, subtended by bracteoles; calyx sessile, subar-

ticulate, subtended by a pair of unequal sharply acuminate and ciliate bracts, 5 mm. long, ferrugineusly hairy on the outside, the upper one half divided into 5 sharply acuminate segments which are rather strongly 3-nerved; corolla white or tinged with brown, the 5 segments strongly recurved, subcampanulate in shape, caducous, 5 mm. long, the segment tips obtuse, glabrous except the whitish hairy throat; stamens as many, alternating with the segments and inserted upon the throat, the filaments glabrous, the anther bluntly oblong; ovary short, ovoidly ellipsoid, also glabrous.

Type specimen 12991, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This distinct species was discovered in very moist humus covered soil of dense woods near a creek flat at 250 feet.

Quite rare and very different from other known Philippine *Psychotriae* by its subherbaceous character and low creeping habit.

Psychotria pyramidata Elm. n. sp.

Suffrutescent; stem erect, 1 to 2 m. high, woody toward the base, 1 cm. thick, only occasionally branched, the branchlets crooked and with suberect tips, terete, glabrous. Leaves thinly coriaceous, ascending or horizontally spreading, glabrous, dull green above, much lighter or subglaucus green beneath, flat and only slightly recurved, curing grayish especially on the nether side, oppositely scattered, not numerous, oblong or oblanceolately oblong, the average blades 2 dm. long by 7.5 cm. wide a trifle above the middle but frequently smaller, apex bluntly obtuse or acute, base subcuneate and occasionally slightly inequilateral, entire, midvein minutely pulverulent, prominently raised; lateral pairs divaricate, 13 to 15 on each side, strict, tips anastomosing, much less prominent; reticulations more numerous and evident toward the entire margins; petiole up to 2.5 cm. long, ascending, subglabrous. Inflorescence strictly erect, terminal, solitary upon a nearly 5 cm. long peduncle which is usually subtended by a pair of foliaceous bracts or small leaves, pyramidally branched above the middle; its main branches in whorls, usually descending, strict, 1.5 cm. long, glabrous, subtended by a short involucral bract, dichotemously rebranched above the middle; the secondary and

ultimate branchlets more or less flattened and pulverulent, all subtended by bract vestiges; flowers in small groups, the middle or terminal one sessile, the lateral ones usually short pedicellate; calyx subglabrous or very finely puberulent, sessile and articulate, 2 mm. long, gradually widening toward the truncate rim which is nearly as wide; corolla glabrous except the cinereous pubescent throat, 4 mm. long, white, at the base subhyaline; segments 5, ligulate, obtuse at apex, ultimately splitting down to below the middle; stamens as many as there are segments and alternating with them; filaments very slender, glabrous; anther oblong, with subtruncate ends, 1 mm. long by 0.5 mm. in width, subversatile; ovary circular, much flattened, glabrous; style 2 mm. long, glabrous toward the base, otherwise sparsely hairy, thickened and subentire or bilobed at the stigmatic portion; drupes obovoid, glabrous, 7 mm. long, smooth and terete, green, then luteus, finally dark black while still attached to the plant, at least 4 mm. thick above the middle, calyx obsolete, 10-costate in the dry state, divaricately spreading; pyrenes 2, plano convex, rounded at apex, pointed at base, 5-ridged on the dorsal side.

Type specimens 13093 for flower and 13183 for fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April and May respectively, 1911.

This undershrub is always found in moist more or less stony soil of deeply shaded places near water courses from 500 to 2500 feet elevation.

Its low sparingly branched habit coupled with the erect pyramidal infrutescence serve to distinguish it at once.

Psychotria iwahigensis Elm. n. sp.

A fine scandent shrub; stem subligneous, the size and shape of an ordinary lead pencil, very flexible, greenish or when old becoming brown, cleaving tightly to its support, few branched 5 m. from the ground; branches slender, only sparingly rebranched, curved, somewhat drooping and with erect tips, the young portion fulvus tomentose. Leaves descending, oppositely scattered along the twigs, thinly coriaceous, flat, glabrous and dark velvety green above, much paler green and minutely pubescent beneath, the obtuse tips only slightly recurved, entire, oblong,

base subcuneate or acute, the average blades 1 dm. long by 4 cm. wide at the middle, curing brown, entire; midvein conspicuous beneath and ferrugineusly tomentose in the dry state; lateral pairs 7 to 9, much less conspicuous, ascendingly curved, similarly pubescent, tips reticulately united, reticulations very obscure; petiole 1 cm. long, fulvus, caniculate along the upper side. Peduncle solitary, terminal, puberulent or cinereous, suberect, 3 cm. long; inflorescence corymbosely paniculate, 4 cm. across, 2 cm. high; branches similar in vestiture, subtended by a whorl of minute sharply pointed bracts, secondary branchlets from above the middle, all subtended by bracteoles; flowers in whorls at the end of the ultimate branchlets; pedicels 2 mm. long, subtended by blunt and short bracteoles; calyx rim-like, hardly apiculate, cinereous as are also the pedicels and bracteoles, 1.5 mm. across; corolla 5 mm. long, subglabrous and narrowest at the base, otherwise umbrinus pulverulent on the outside; the 5 segments nearly one half as long, glabrous on the upper side, acuminate, reflexed; tube also glabrous except the grayish hairy or woolly throat; stamens of an equal number, alternating with the segments, adnate or inserted upon the corolla throat, usually a trifle shorter than the corolla segments; filaments glabrous; anthers yellowish, 1 mm. long, oblong, with blunt ends, dorsifixed; ovary circular, glabrous, 1 mm. across, much less in height; style 2 to 3 mm. long, the upper portion thickened and becoming split into 2 stigmatic arms, glabrous, very slender toward the base, the stigmatic sides pulverulent or even granular.

Type specimen 13052, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

A tight tree trunk climber and forming loose masses at the top, in moist soil of a densely forested flat at 250 feet altitude. Quite rare!

Evidently related to *P. sibuyanensis Elm.*, yet one is glabrous the other pubescent.

Psychotria versicolor Elm. n. sp.

Tree-like or an erect shrub; stem 12.5 cm. thick, 7 m. high, terete, at the middle divided into main branches; wood hard and brittle, dingy white, odorless, bitterish; bark smooth, brown and

white blotched; branches freely rebranched, very crooked, the glabrous ultimate ones suberect, rather slender. Leaves ascending or horizontal, coriaceous, much paler green beneath, shallowly folded upon the upper dark green surface, drying blackish brown, acute apex recurved, cuneate or attenuate toward the base, opposite, more or less crowded at the ends of the twigs, oblanceolate to oblong, entire, very small leaves usually mixed in with the larger ones, the larger blades 15 cm. long by 4 cm. wide above the middle; petiole glabrous, up to 3 cm. long, flattened along the upper side, reddish brown when dry; midvein similar in color, prominent, also glabrous; lateral nerves less prominent, 9 to 12 pairs, ascendingly curved especially toward their tips which are usually united, reticulations equally obscure from both sides. Inflorescence terminal, erect, green except the creamy white corolla buds, glabrous, solitary, 5 to 8 cm. long, at the base subtended by a pair of foliaceous bracts, verticellately branched above the middle; the short divaricate branches subtended by very short usually ciliate involucral bracts; flowers few clustered toward the distal end of the branchlets, subtended by similar bracts, subsessile; calyx 3 mm. long, nearly as wide across the top, glaucus green, glabrous, more tapering toward the base, rim truncate or with mere vestiges of 5 teeth; corolla creamy white even in the bud state, oblong, nearly 1 cm. long, glabrous except the yellowish gray woolly throat; the 5 segments oblong, with incurved apical tips especially in the early state, in anthesis split down to below the middle; anthers also 5, alternating with the corolla segments and inserted or adnate from the corolla throat; filaments bearded along the inner side below the anthers, otherwise glabrous and somewhat compressed; anthers oblong, with rounded ends; style strict, glabrous; stigmatic lobes fleshy, compressed, 2, rounded at the apex, granular; ovary short ellipsoid, also glabrous, rather hard, well surrounded by the calyx; infrutescence 15 cm. long including the peduncle, at least 10 cm. wide, subpendulous, green; terminal drupes sessile, the lateral ones short pedicellate, 7.5 mm. long including the calyx rim, at least 5 mm. across the middle, glabrous, varying from green to auranticus red and finally nearly black on the same infrutescence; pyrenes plano convex, 5 mm. long, elliptic from the smooth ventral side, only 1 obscure ridge through the middle of the back, otherwise obscurely rugose but rather plump.

Type specimen 12763, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

It was rather commonly observed in gravelly soil along the wooded banks of the Iwahig river at 500 feet.

Another addition to a critical bunch, most closely to *P. similis Elm.* but leaves in our present species thicker, less pointed at both ends and the more numerous nerves bolder and plainly interarching. The arrangement of the flowers on the inflorescence is also quite different.

RANDIA Linn.

Randia uncaria Elm.

Field-note:—A lofty tree climber; stem terete, looping, 3 inches thick; wood soft, yellowish, a trifle bitter, odorless, the outside of the sapwood yellowish brown and juicy; bark relatively thick, brown on the stem, roughened with blunt lenticels, yellowish white on the inner side, yellowish brown; the main branches stem-like, long, looping, the free portions pendant; secondary branches divaricate, comparatively short, with a pair of stout retrorse spines along the upper side and about 1 inch from the point of branching, frequently with a single spine on the same side 2 inches further up, stems and twigs spineless; leaves subcoriaceous, horizontal or descending, flat, deep green above, paler beneath; inflorescence terminal, suberect, pale green even the corolla tube, sweetly fragrant, style and stigma creamy white, ovary apex creamy yellow; corolla segments rotately spreading, white.

Represented by number 12661, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

In fine gravelly soil of forested flats at sea level. The Tagbanuas call it "Keri-keri."

Randia ebracteata Elm. n. sp.

A rather small gnarly tree; trunk nearly 3 dm. thick, 10 m. high, terete, branched above the middle; main branches spreading, forming a flattish crown, freely rebranched, the rather rigid

and glabrous twigs suberect; wood sappy white, rather soft, odorless, slightly bitter; bark smoothish, avellaneus except the grayish brown surface. Leaves opposite, mainly toward the ends of the branchlets, coriaceous, spreading in all directions, very deep shining green above even in the dry state, much paler green and duller beneath, drying brown, the entire margin wavy toward the recurved short obtuse apex, obtuse or cuneate at base, glabrous, obovately oblong or merely oblong, the average blades 15 cm. long by 6 cm. wide across the middle or above it; midvein very prominent beneath, fluted on the upper side of the blade, reddish brown, also glabrous; the 6 to 8 lateral pairs ascending, curved, their tips gradually becoming obsolete, reticulations not evident; petiole very stout, up to 2 cm. long, glabrous and brown; stipule broad, at least 1 cm. long, brown, oblong, the apex abruptly tapering into an acuminate point, entirely glabrous. Inflorescence paniculate from below the middle, 5 cm. long, usually upon 3 peduncles which are glabrous and subtended by stipule-like bracts; pedicels varying up to 5 mm. long, strict, slender, glabrate, ebracteolate; calyx yellowish green, glabrous, turbinate, 5 mm. long, 4 mm. wide across the top, terminated by 5 sharply apiculate teeth; corolla 6 mm. long, glabrous except the cinereous hairy throat; tube 2.5 mm. long or less, nearly 2 mm. thick, blackish striate; segments 5, rotately spreading or deflexed, thick, luteus, fully 3 mm. long, oblongish, obtusely rounded at the apex; stamens as many as there are corolla segments, inserted upon its throat and alternating with the petals; filaments also luteus, very short, flattened, glabrous, stout; anther erect, lance shaped, bilobed at the basifixed base, gradually tapering into a sharp point, 1.5 mm. long, more than 0.5 mm. wide across the base; style fleshy, 4 mm. long, terete, glabrous; stigma much thickened, 1.5 mm. long, the 2 lobes rugulose or papillose.

Type specimen 13114, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Here and there found standing upon red stony soil of densely wooded banks of the Iwahig river at 500 feet.

All my material is without the bracts subtending the pedicels and the inflorescent branches. In *R. wallichii Hook.* the bracts are present and so are they in most of our other Philippine material.

SPERMACOCE Dill.

Spermacoce meyeniana Walp.

Field-note:—Erect and widely spreading biennial herb; stem 1 foot to 1 yard high, branched from near the base, green and angular; branches ascending, similar to the stem and the lower ones nearly as long; leaves flat, thinly coriaceous, much paler green beneath; inflorescence dense, axillary, pale green.

Represented by number 12937, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

It thrives in compact red clay along the trail to Napsan at 750 feet in dense humid forests.

This species may be exactly *Hedyotis congesta R. Br.*

STREBLOSA Val.

Streblosa glabra Val.

Field-note:—Erect or suberect low suffrutescent perennial; stem 1 foot high, dark green, smooth, subherbaceous, erect or ascending and reclining toward the base, crooked, unbranched, 0.25 inch thick; leaves horizontal or descending, brightly shining and deep green above, much lighter or paler green beneath, membranous, flat or nearly so; young infrutescence usually from the upper leaf axils, the virgate dark green branchlets divaricate; fruits also dark green, soft pubescent, 0.15 inch long, sessile, subtended by green bracts, ellipsoid, terete and smooth; calyx of 5 imbricate segments, united at the base and forming a rugosely enlarged zone, the sides of the acuminate segments sharply folded upon the inner side; corolla buds imbricate and slightly twisted from left to right, the 5 lobes ultimately splitting down below the middle, the basal one third tubular, glabrous; stamens 5, also glabrous, inserted upon the basal portion of the corolla tube, not exerted, erect; filaments one half as long as the anthers, free; anthers linearly 2-lobed at the base, linear or lanceolate, acuminate, basifixed, more or less united and enclosing the stigma; style slender, glabrous; stigma submitraform; ovary superior or nearly so, surrounded by 5 lobular disk appendages, glabrous,

subcompressed, 2-celled, each cell contains a single pendulous flattened ovule.

Represented by number 12885, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in rich moist humus covered soil of humid forests at 750 feet along the trail to Napsan.

A monotypic genus previously known only from Borneo.

SARCOCEPHALUS Afzel.

Sarcocephalus fluviatilis Elm. n. sp.

Shrubs; stem crooked, 1 dm. thick, angular or wadded, 3 to 5 m. high, branched from below the middle; wood sappy white, quite heavy and moderately hard, without odor or taste; bark gray on the branches, dull brown on the stem; branches crookedly rebranched, horizontally spreading; the branchlets lax, numerous, ascendingly curved, usually with a fusiform thickening, puberulent or finely hairy toward their ends. Leaves in few to several pairs toward the distal ends of the twigs, obovately oblong or the smaller ones oblanceolate, averaging 12.5 cm. long by 5 cm. wide above the middle, obtusely and occasionally inequilaterally rounded at the base, terminated by a short blunt apex or in the smaller blades sharply acute, entire, spreading horizontally, recurved at distal end, otherwise flat, submembranous, glabrous and dark velvety green above, much paler and lighter green beneath; midvein prominent beneath, olivaceus hairy in the dry state; lateral pairs 7 to 9, ascendingly curved, tips reticulately united, less prominent and pubescent; reticulations evident, subglabrous, otherwise the leaf surface is glabrous except in the very young state; petiole less than 1 cm. long, stout, pubescent or glabrate when old; stipule caducous, brown, 1 to 1.5 cm. long, linearly oblong, hairy on the back especially below the middle, flat, 4.5 mm. wide; heads solitary, terminal, 4 cm. across, creamy white except the green calyx; peduncle 2 cm. long, suberect, glabrate, minutely lenticelled, subtended by a pair of stipular bracts, stout and usually angular; calyx glabrous, angularly compressed, 3 to 4 mm. long, the basal one third encasing the ovary, the upper two thirds green

and united or separating into 5 lanceolately linear segments whose apices usually terminate into setae-like tails, 4 mm. long, finely carinate; receptacle subtended by a thick rim, the individual flowers subtended by minute glabrous involucral bracts; corolla creamy white, usually curved, 1 to 1.5 cm. long, tubular but narrowest toward the base, glabrous or a trifle strigose on the outside in the region of the throat; segments 5, oblong, 2.5 mm. long, 1 mm. wide, roundly obtuse at apex, irregularly spreading; anthers 5, inserted in the throat, subalternating with the segments, upon 0.5 mm. long glabrous filaments, finely sagittate at the base, basifixed, linear, 1.5 mm. long; style relatively thick, subterete, fleshy, glabrous, exerted and usually curved, terminated by a subglobose stigma; cells of the ovary 2, subcompressed, pendant, numerously ovuled; fruiting heads subpendant, grayish yellow, ovoidly or irregularly globose, 5 cm. long, straw brown, truncate at apex, angled, sharply pointed toward the base, separating into 2 equal halves, 6 mm. across the thickened top; seeds brown, nearly 2 mm. long, subcompressed, sparsely strigose or puberulent, at the upper end provided with a beard of yellowish brown hairs, the opposite end provided with a silvery coma or tuft of very fine 10 mm. long hairs;

Type specimen 12848, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found only along deeply shaded streams and rivers at 1000 feet, upon ledges from where the branches had a chance of spreading over the cool water or creek beds.

Ours is a *Sarcocephalus* with solid concrete heads, though resembling *Nauclea strigosa Korth.* from which it differs in having the 5 not 4 calyx segments well laciniate instead of appendiculate, nerves on the underside of leaves always pubescent, stipules are also of a slightly different shape.

TARENNA Gaertn.

Tarenna fragrans (Blm.) K. et V.

Field-note:—Slender erect tree; stem terete, 7 inches thick, 35 feet high; wood burly, moderately hard and quite heavy, dirty white, odorless and tasteless; bark smooth, ater colored;

main branches from near the middle, ascending, rather slender, rebranched at the top only; twigs relatively short, bendable, ascending, angular; leaves well ascending, coriaceous, folded upon the upper slightly darker green surface, nerves beneath greenish white; infrutescence erect, the main stalks scurfy brown, the pedicels dull green; fruits perfectly globose, glaucus, 2-celled, with a number of dry yellowish green trigonous seeds in each.

Represented by number 12768, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in fertile humus covered soil of dense woods along the Iwahig river at 500 feet elevation.

This species cannot be referred to *Tarenna arborea Elm.* n. comb. (*Randia arborea Elm.* Leaf. Philip. Bot. III; 1005, 1911), which has pubescent under leaf surfaces and lateral nerves not at all oblique as in our present specimens. There are also floral differences.

TIMONIUS Rumph.

Timonius gammillii Elm.

Field-note:—Shrub-like tree; stem 3 inches thick, rather crooked, 15 feet high, scantily branched toward the top only; wood heavy, nearly avellaneus toward the center at least, odorless and tasteless; bark ater, smooth; branches slender and spreading, the tips suberect; leaves thinly coriaceous, nearly flat, darker green and shining on the upper surface, horizontal, the tip more or less recurved; infrutescence descending, green, hard, subglobose; fruits upon strict 2 cm. long subcompressed hairy peduncles, nearly 1 cm. long, including the persistent calyx rim, subglobose, with truncate ends, avellaneus when dry, short but densely pubescent, usually 3-clustered, the terminal one sessile, the 2 lateral upon short divaricate pedicels and subtended by a small sharply pointed bract; seeds numerous, more or less grouped into 5 or 6 masses and giving the fruit an angular shape; the persistent green calyx tube with a brown rim.

Represented by number 12734, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in a humus covered fertile soil of thick woods at 250 feet altitude.

Timonius pulgarensis Elm. n. sp.

A rigidly interlaced shrub; branchlets erect, glabrous except the fulvus pubescent young tips, otherwise grayish brown, made rough by the numerous leaf scars 1.5 cm. apart. Leaves opposite, 1 to 3 pairs crowded toward the ends of the twigs, ascending or suberect, rigid, flat except the short sharply acuminate apex, base obtuse, entire margins subinvolute in the dry state, when young floccosely cinereous on the upper surface but which soon becomes glabrous and shining, beneath fulvus strigose or appressed pubescent, mostly obovately oblong, the larger blades 12.5 cm. long, 5 cm. wide across the middle or a trifle above this; midvein very prominent beneath toward the base, densely fulvus hairy; lateral pairs 7, subparallel, very oblique, their tips slenderly curved, reticulations very fine and minute; petiole extremely short and thick, less than 5 mm. long, flattened on the upper side; stipules also rigid, subpersistent, oblong, 1.5 cm. long, sharply acuminate, more or less united below the middle or toward the base. Fruits axillary, solitary; pedicel 1.5 cm. long, fulvus hairy, strict, ascending, obovoidly oblong, 1 to 1.5 cm. long, 5 to 8 mm. thick above the middle, rugose not ridged or only obscurely so, silky or fulvus pubescent, subtended by a pair of finely setaceous and similarly pubescent 1.25 cm. long bracts, 9 to 11-seeded; persistent calyx 1.25 cm. long, brown and softly pubescent, the basal portion united into a tube, the 5 segments linearly setaceous.

Type specimen 13201, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

This very distinct species was discovered in the low and dense chaparral growth on the rocky summit at 4250 feet of the mountain whose name it bears.

Timonius palawanensis Elm. n. sp.

A strict slender shrub-like tree; stem 7.5 cm. thick, 7 m. high, terete, branched from the middle; wood moderately hard, sappy white, a trifle bitter, odorless; bark smooth, grayish white;

branches divaricate, sparingly rebranched, forming an elongated crown; twigs suberect, roughened with scars, grayish green, only the young apical portion olivaceous hairy. Leaves thinly coriaceous, ascending or horizontally disposed, much deeper green on the upper side, the young leaves light green, finely pubescent beneath, the upper surface soon becoming glabrous, unequally brown in the dry state, diverse in size, opposite, crowded toward the distal ends of the branchlets, apex obtuse but the tip very sharp and hairy, gradually narrowed toward the pandurate base, obovately oblong, 2.5 dm. long by 8.5 cm. wide a trifle above the middle, margins thin and entire, 1 cm. wide at the base; petiole stout, 3 to 5 mm. long, olivaceus pubescent; midvein very conspicuous beneath, similarly pubescent; lateral nerves 7 to 10 on a side, strongly ascending and curved, also pubescent, cross bars faint; stipule deciduous, 1.25 cm. long, broadly ovate, terminated into a tail-like point which as well as the edges are densely pubescent, otherwise only sparsely so. Inflorescence erect, solitary and erect or when 3 the lateral ones divaricate, rigid, the stalks green and similarly hairy; peduncle 1 to 3 cm. long, straight, stout, subtended by bracts, circinately branched toward the top; ultimate segments and basal portion of calyx densely tawny; calyx cup shaped, cinereous in the middle region, the truncate or 5-apiculate calyx rim tawny and 4 mm. across, scarcely any deeper, hard and rigid, sessile, usually subtended by small linear similarly colored hairs; corolla densely velvety on the outside, nearly 2 cm. long, otherwise glabrous, gradually tapering from base to throat, creamy white; segments 4, reflexed or rotately spreading, fleshy and padded on the upper glabrous side, nearly 1 cm. long, oblong, obtuse at apex; anthers also 4, alternating with the segments, attached 2 to 3 mm. below the throat, upon short, flattened and glabrous filaments, dorsifixed, linear, outwardly curved at the distal end, sharply sagittate at the base, strigose on the back above the middle, dull yellow or brownish so; style striate, terete, 5 to 8 mm. long, subglabrous or puberulent, minutely lobulate at the apex, 0.75 mm. thick.

Type specimen 12705, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Discovered in deep fertile soil of creek banks of well shaded woods at 100 feet altitude. The Tagbanuas call it "Bunkol."

These staminate flowering specimens though quite similar are yet distinguishable from the staminate type of *T. valetonii Elm.*

WENDLANDIA Bartl.

Wendlandia luzoniensis DC.

Field-note:—A small tree; stem 6 inches thick, 20 feet high, branched from the middle; wood dark, heavy, dingy or yellowish white, without odor or taste; bark checked, brown; branches smooth, yellowish brown, the few slender twigs ascending; leaves thickly membranous, descending, folded upon the upper deeper green surface; panicle terminal, pale green except the white slightly fragrant flowers; anthers yellow.

Represented by number 12748, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in shallow red soil with a gravelly subsoil upon wooded stream banks at 250 feet.

LEAFLETS OF PHILIPPINE BOTANY

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A FASCICLE OF PALAWAN FIGS

By

A. D. E. Elmer

The island of Palawan or Paragua is about 275 miles long and varies from 6 to 26 miles wide. It extends in a southwesterly and northeasterly direction, and seems to indicate a geological connection between Borneo and the Philippines along the western side. To the north of the island of Palawan are a number of irregular islands called the Calamianes group. The two largest of these are Busuanga and Culion, and in between them on the eastern side is a characteristic small triangularly shaped island called Coron. The geological formation and the vegetation of the two larger islands are the same, namely, of hills or low well worn down mountain ranges covered with cogon or lalang; and their depressions or moist slopes and the higher summits are covered with woods. On the island of Culion is the Government Leper Colony. Coron is very near to these two islands and yet so different geologically and botanically. This whole island is nothing but a mass of rocks standing out perpendicularly from the sea from 500 to 1500 feet above its level. The summit portion is more or less worn into sharp edges and narrow depressions down its sides. There is no cogon on it and here and there in the crevices of depressions or sheltered places are scrubby plants chiefly of a different kind than is found on the other islands. While the "Garcia Pitogo" was slowly steaming through the narrow channel between Coron and Busuanga, I could easily discern a slender species of palm standing

well above the vegetation on the summit crags. There is a mountainous backbone throughout the length of Palawan, although occasionally it appears to be completely broken from the surface view. This range of mountains is supposed to be of volcanic origin and on the whole runs nearer to the China than to the Sulu seacoast. The disintegration and alluvial deposits from these mountains have formed the upper plains lying between the level seacoast tract and the foothills. The level seacoast plain of southern Palawan is partly formed by the coral reefs which are extensive along both coasts of the southern one half of the island. The numerous islets along the main coast and the chief formation of some of the larger islands at the extreme end of Palawan is of coral. The sea between this Balabac group of islets and those of British North Borneo is estimated at 100 fathoms deep, while the broad channel between Busuanga and Mindoro is seven times as deep.

The two most interesting places of mountainous regions and their vicinities are that of Cleopatra needle from St. Paul's bay and mount Mantalingajan with the Pagoda cliff. Cleopatra is 5200 feet high, very sharply pointed and is said to contain magnificent crystals. To the northwest of it is St. Paul's bay on the west or China seacoast side. Into this bay empties a subterranean river, an account of which I here reproduce from "The Far Eastern Review," published last December. The editors state that most of this information is taken from a report on the survey operations executed under the direction of *Secretary C. B. Elliott* and by *Mr. E. R. Frisbie*, chief computer in the Bureau of Coast and Geodetic Survey.

"The cove into which the subterranean river empties is near the center of St. Paul Bay, and about three miles northeast of a small barrio situated in the extreme southern part of the bay. The entrance to this cove on the southern side is strikingly marked by a point sloping down to an elevation of about 25 meters, and abruptly terminating in a massive flat topped tower of rock, with vertical sides, closely resembling a fortified castle tower when seen from the northeast or southwest, close in shore. The north side of the cove is a steep wooded slope, showing occasional glimpses of bare cliff. At the head of the cove are 200 to 300 meters of sandy beach, across the north end of which the river flows. Off the mouth of the river is a bar with a depth

of from 2 to 4 feet, depending on the tide. After crossing the bar, deeper water is found in the short channel where the river crosses the beach, and immediately behind the beach is a lagoon about 120 meters long by 25 to 30 meters wide, and with depths of 6 to 8 feet. The river empties into the upper end of this lagoon through an irregular arched opening at the base of a vertical cliff. The arch is some 6 or 7 meters in height, and roughly three times this in width. Just inside the entrance the channel is broken by columns and longitudinal knife edges hanging from the roof, which divide it into numerous small openings just capable of passing a boat. Fifty meters upstream these obstructions disappear, leaving a single clear channel, but for the first 400 or 500 meters there are numerous small side openings or pockets. At a distance of 200 meters daylight is seen through one of these crevices, and at 500 meters the channel opens into the first prominent chamber, containing columns, stalactites, and one very prominent stalagmite.

"The next 1000 meters is characterized by a long straight channel, with an easy curve near its center. This channel, although rich in local detail, is strikingly regular in the main outlines, which consist of straight vertical bands curving upward into inclined roof sides which meet in a central ridge modified at its apex by small parallel hanging blades. Throughout this channel are numerous beautiful forms of stalactites, resembling chandeliers, bulbs, plates and hanging points and blades, but no stalagmites, as the entire width of the cavern is occupied by the river.

"At 1500 meters this tunnel section continues in an elevated prolongation extending upward beyond the river, which at this point flows through an arch about 2 meters high on the west side of the channel. On the east side of the channel, opposite this arch, and just inside the beginning of the elevated cavern, a small waterfall, which attracts attention through its volume of sound, is hidden in a narrow crevice. After passing under the arch the section becomes more broken, consisting of irregular chambers for about 200 meters, when another low arch is encountered, beyond which the chambers become larger.

"Continuing upstream for the next 1000 meters, or to a point about 2700 meters from the entrance, a large chamber is found, where the stream abruptly turns, first to the right, and then to

the left around a prominent sharp shoulder reaching to the lofty roof. On the right is a large elevated cavern with two prominent pillars near the bank of the stream. This 1000 meters is characterized by the increasing size of the chambers, and by mud banks piled in shelves in side pockets. These banks are rare in the lower portions of the river, but after reaching this point they become increasingly apparent, both where they are piled in the recesses by flood water, and at short stretches, first on one bank, and then on the other.

"Proceeding upstream from the prominent chamber above mentioned, the section contracts to one similar to the straight channel as described between the 500 and 1500 meter points, but on a somewhat larger scale. This continues for about 300 meters, or to about 3000 meters from the entrance, where, after a slight reverse curve, the cavern opens into a series of chambers considerably larger than any previously encountered. This succession of chambers continues for about 1000 meters, or to the 4000 meter point, where the survey terminated. In this last section the side walls frequently recede from the stream, which is left to meander between mud banks on either side, while the roof rises in places to heights estimated at over 30 meters. The depth of the stream diminishes, so that it is frequently necessary to maneuver the boats to avoid grounding on shoals.

"At about 4000 meters the stream is entirely blocked in a small pool, from which a noticeable current flows downstream but into which no current could be found entering. The pool is bounded on the right by a solid rock wall, but its left side consists of a pile of boulders and loose debris perhaps 12 meters in height, and lying just beyond an immense column supporting two roof arches. So far as is known, progress in boats is impossible beyond this point, and the party making this investigation had not enough time at its disposal to attempt to continue the survey on foot. An ascent was, however, made to the top of the rock heap which barred further progress, and it could be seen by means of an electric hand lamp that there was a continuation of the cave in the distance beyond. Whether this opening contained water was not ascertained. The last point reached lies about 1000 meters N. N. W. from the peak of St. Paul Mountain, which is given an elevation of 1027 meters on the charts.

"The stream in general fills the entire cavern between usually straight walls, and there are no navigable side openings of any importance, so that there is no difficulty in following the channel. The water is fresh, and at the time of this survey was flowing in a gentle current hardly exceeding half a mile an hour. There are marks on the side walls indicating that the flood level may be 4 or 5 feet higher than when the survey was made. At places water drips from the roof in small quantities, but in general the cavern is dry. The air is pure and cool, and at a number of places a gentle downstream breeze is noted. At the upper end of the stream are small fish, doubtless blind, as the flash of an electric lamp within a distance of one foot caused no movement. Just inside the entrance are thousands of swallows and bats, but after a distance of 300 or 400 meters their number diminishes. They are quite rare in the upper sections."

Soon after landing in Puerto Princesa my botanical supplies were transferred to a small provincial craft called "Florencia" and after two days and nights I landed at Point Sir J. Brookes at about the middle of February last year. This place is a short level coral extension cleared of its beach forests and undergrowth except the large trees of *Sterculia foetida Linn.*, *Ceiba pentandra Gaertn.* and a few other tree species. At present there are a few substantial iron roofed buildings and a row of small light material houses. The military maintain a small detachment of troops at this place and with an assistant civil governor keep the situation well under control. The government is now opening up a bridle trail and telephone line from Puerto Princesa southward on the east coast clear down to Bonabona or Marangas in San Antonio bay which is situated about 15 miles south of Brooks Point. The visitor is pleased with the general view from the sea. Its seacoast line is sandy and with coral extensions into it. For miles, both north and south, there are no mangrove nor nipa swamps, only the pure beach type of forests predominating upon the dry coral sand and gravelly soil. Most of the trees closely front the water's edge. Their trunks are stout and burly, with low spreading branches. The shining glabrous and usually thick foliage forms a dense canopy of green and hiding the unsightly stems, crooked branches and thick twigs. The flowers of many of these beach plants are succulent and their

fruits are usually adapted for water dissemination. Over all of these tree species are succulent vines and between them are shrubby seacoast plants. This beach vegetation abruptly merges into a higher and more truly forested strip. Behind this dry forested coastal region are one or more semiswampy extensions of rather narrow widths running parallel with the coast. These low subaquatic areas contain a stagnant mixture of fresh and saline dark colored water. These places are formed through the agency of small slow flowing rivers emptying into a shallow peaceful sea. During low water the action of the sea is stronger and gradually piles up a sand bar across the mouth of the river, thereby forcing it to curve and to wash its course out along the sandy beach line. During a heavy flood the rush of the river breaks through the sand bar and again it has a straight outlet into the sea. The abandoned course which by disuse becomes silted by the sea and the river. This shallow newly formed pond is gradually filled in by vegetable débris, more and more encroached upon by subaquatic vegetation and ultimately becomes forested. A characteristic plant of this vegetable formation is a broad leafed rattan palm. This coarse species in favorable places forms dense jungles. The leafy portion of the stem is very spinescent. Over these spines a species of ants constructs a layer of vegetable matter and under which it lives between the spines. When they are disturbed they set up a rhythmic hum which gradually dies out. Often I have aroused their noise in the lofty trees by jerking on the stem below. This same species of palm was noticed once or twice upon damp creek banks in the vicinity of Puerto Princesa but without the ants. Beyond this marshy strip the real coastal plain begins and is from two to five miles deep and extends clear to the base of the foothills. Its vegetation is mostly of the cogon grass and several species of bamboos. *Bambusa vulgaris Wendl.* is a fine stemmed bamboo and forms large dense tussocks. In more or less alluvial flats its jungle growth covers acres in extent. The 10 to 15 feet long and 0.75 to 1 inch thick stems are very numerous. *Schizostachyum acutiflorum Munro* is also very abundant but does not form jungles. It is a medium sized tree in scattered clusters. Its numerous branches are highly polished and yellowish in color. Of this there seems to be an unlimited quantity of bamboo sticks for curtain making.

In the depressions and in other moist more fertile soil are secondary woods. The cogon formation extends well up over the timberless ridges into the foothills. This is very plainly shown by *Mr. John Whithead's* plate between pages 140 and 141 of his Exploration of Mount Kina Balu, North Borneo. Furthermore, the whole picture represents a good bird's eye view from the sea looking westward. Brook's Point is located to the right of his sketch. To the foreground is a rugged coastal range terminated at its northern end by a sharp point called Addison peak. The upper two thirds of this range is densely wooded, the peak itself is much higher and forms a characteristic landmark to navigators. The Lara river empties into the sea several miles north of Brooks Point, flows closely around the northern base of Addison peak and seems to wind in behind and around several other ridges before its head waters are reached on the north or northeastern slopes of mount Mantalingajan or Kalamutan as *Whithead* calls it. This is the highest mountain on Palawan and is charted to be 6843 feet high. It is densely forested clear to the summit and from the eastern side above the Addison range and it does not seem perpendicular. The northern, eastern and western slopes are comparatively short and with a good high mountain pitch. To the south is a long prominent ridge with minor spurs. The chief of these terminates very abruptly or nearly perpendicularly into what is called the grayish white Pagoda cliffs. The whole mountain is situated pretty well to the rear of the coastal range and I suspect is nearer to the China than to the Sulu sea. Just northward of it the mountains are broken up into a series of irregular ranges which further to the north soon collect themselves into a massive and higher mountain or two named Landargun and Gantung respectively.

Most of the natives in southern Palawan are Tagbanuas or Dusuns according to *Mr. Whithead.* They are especially numerous on the plains back of Brooks Point and in the foothills of the mountains to the north of Addison peak and mount Mantalingajan. They do not live on the coast, although frequently they come to the sea for fish, salt water and for the purpose of bartering with the Chinese and more recently with the Moros or Sulus. They are a harmless shy people, living in small light material huts arranged in smaller or larger groups. From any one of these settlements they have trails leading

directly down to the coast and usually the same trails continue some distance beyond their houses up into the foothills or mountains. These are miserable trails, planned out in a winding fashion for a purpose. Besides these numerous and deceiving trails from the inhabitants to the coast, there is a good common trail running close to the base of the foothills and parallel with the coast. This main thouroughfare connects with nearly all the larger settlements. Having this network of intersecting trails they feel rather secure in case of malicious intruders from the coast. All these natives of certain geographical areas are under the control and direction of chiefs, called Panglimas. They have practically no agriculture nor stock, and their general condition and appearance is very primitive and poor. This, in my opinion, is not so much the result of having been continuously at a disadvantage of a stronger tribe as it is an innate weakness in themselves. The government has so far failed to impress them with the idea that for certain protection they owe an obligation of a small amount of annual service in payment of a head tax. And when pressure or force is brought against them they feel insulted and revengeful, no matter whether ten centavos or ten pesos a day is offered besides rations. The government holds their land in trust for them as a reservation, reasonably exchanges their crude produce with store commodities and tries to establish in them the necessity of work and obligation. Along the coast of this same portion of Palawan are a considerable number of Moros. Many of these have carried on depredations especially along the western side. For this class the government has a reservation at Bonabona and are under the control of the authorities at Brooks Point. The better classes of Moros are fairly good workers and are more just in their dealings with others. The most primitive natives are the Bataks, scattered in the mountainous region of middle Palawan. They are the least numerous and are like the Negritos in their curly hair. The most enlightened natives are the Christian Filipinos, commonly scattered in northern Palawan but exceedingly scarce in the southern part. It was this last fact that made me return to Puerto Princesa and locate on the Iwahig Penal Colony Reservation. Puerto Princesa is the official center and is beautifully located on the south inner side of the bay by that same name. The land of this peninsula is practically flat, its

soil well disintegrated to a fair depth and covered with woods and forests except for the clearings that have from time to time been made. There is an old road from the town across the point to the north seacoast, a distance of about five miles. It was built in Spanish times and was used by them as a drive or boulevard. The mountain range is directly opposite the town across the bay. The quarters of the colonists are on the Iwahig river seven miles from its mouth. Here the soil of the secondary and primary forested flats is of a newer formation, having been transported from the close range as rocky débris and in most places this gravel or stony soil is covered over with a thin blanket of clay, due to recent disintegration. It is rather unfortunate that the agricultural part of the penal reservation could not have been settled upon a more fertile soil such as is on the Puerto Princesa peninsula; the timber and water resources are better at Iwahig. The range comprises several rather prominent peaks or mounts, the highest is mount Pulgar or Thumb peak. It is 4260 feet high and is rather close to Iwahig. To the north of it is mount Beaufort several hundred feet less in altitude, after which the range runs at only one half that altitude until toward Cleopatra needle. To the south of Pulgar are several rather high mounts or peaks, the nearest to Pulgar is Stavely. Further southwards there is quite a saddle in the island's backbone until the gentle rise up to Victoria peak whose altitude is charted as 5680 feet. The name Pulgar in Spanish means thumb, and the mountain originally received this name because of the 500 to 750 feet of rocky summit having a strong likeness to a thumb. The highest point is only a short and narrow ridge a trifle precipitous on the northern side. Here one has a panoramic view northward to Cleopatra, southward to Victoria; eastward over the reservation, the bay and across the Puerto Princesa peninsula; and westward the white coast line lies closer to one's feet than does the east coast. The whole summit region is covered with low, well interlaced and rigid chaparral growth. Immediately to the south of the summit is quite a densely forested basin in which the northwest fork of the Iwahig river rises; the other fork is more to the south before it turns into the range. Along this southern branch is cut a good trail and a telephone line built across the low divide to Anepahan or Napsahan or only Napsan as it is now called and which is situat-

ed on the west coast of Palawan. They say it is only 15 miles across. The Balsahan river rises on the rounded and heavily forested Beaufort, is considerably smaller than the combined branches of the Iwahig and empties into the bay several miles to the north. The trail leading to Pulgar first passes through a dense dipterocarp forest, crosses a small stream and abruptly ascends a ridge for about 1000 feet. At this point is a lookout house named "Baguio." Beyond this place the trail continues along the ridge up to about 2500 feet altitude. This entire ridge is densely covered with *Dinachloa scandens O. Kze.* which sprawls, climbs and hangs in great profusion and nearly the entire mass of it was loaded with fruit. From this long bamboo ridge the trail to mount Pulgar turns more directly southward, crosses a densely wooded stream depression and follows the main forested ridge until about 3600 feet when it becomes steeper, more rocky and where the woods give way to shrubby vegetation. I have only once succeeded in coaxing my two colonial companions to the summit. The peak vegetation was a revelation to me, and out of that day's collection I find over twenty five new species of flowering plants alone. Among the other already known plants gathered, the most interesting is *Quercus merrillii Seem.* This is the only scrub oak known in the Philippines and so far it has not been collected elsewhere. Further down in the humid woods or forests is a second oak species of good stature and which will in some future article be dedicated to *Governor J. H. Evans.*

The figs are not very numerous on Palawan, only twenty four species were collected of which eight are in the following pages proposed as new. Most of the novelties are rather remarkable distinct species. Other especially interesting ones are *F. recurva Blm.* which is quite typical and is collected and reported here for the first time from the Philippines. The rediscovery of *F. copelandii C. B. Rob.* is most interesting because of its first range extension and I should also expect it in British North Borneo. *F. pseudopalma Blco.* was not seen either at Brooks Point or at Puerto Princesa. It is a common species throughout the middle portion of the Philippines, less common in the north of Luzon, rare in southern Mindanao and lacking in the southeastern portion of Palawan. Another noteable instance in this fascicle is the absence of *F. minahassae*

Miq. In all of my travels I have always observed this most characteristic of all figs. It occurs in southern Mindanao and no doubt on the Sulu islands. The absence on Palawan would indicate its distribution to extend from Celebes along eastern Borneo into the Philippines by way of the Sulu archipelago. *F. palawanense Merr.* is common in middle Palawan, only occasionally found elsewhere in the Philippines south of Manila.

As upon all other islands, Palawan has its share of deer, monkeys and wild hogs. Its waters contain numerous fish, some of excellent size and quality. Monstrous crocodiles are known and are to be expected at the mouths of large rivers. There is a species of wild peacock in the woods and upon the cliffs are swallows who construct their nests with secreted saliva. These nests are gathered by the Chinese for food and are said to bring fabulous prices from the wealthy classes. Butterflies are rich in favorable places, a few rare species are in great demand. On this island there is a small species of porcupine and on Balabac are numerous mouse-deer.

Key for the groups.

a. Palm-like shrubs. .... Group I.
aa. Branches of trees, shrubs and vines otherwise.
  b. Leaves tessellate. .... Group II.
  bb. Leaves not tessellate.
    c. Figs on tubercles from stem and occasionally from larger branches.
      d. Tubercles lax, long and slender. .... Group III.
      dd. Tubercles rigid, thick and relatively short. Group IV.
    cc. Figs chiefly in the leaf axils, occasionally clustered along the twigs.
      d. Figs sessile, ruber red and subtended by blunt bracts; leaf petioles short. .... Group V.
      dd. Figs upon long rigid peduncles, yellowish and subtended by sharp bracts; leaf petioles long. .... Group VI.
      ddd. Figs with other characters except color; leaf petioles short.

e. Figs 2.5 to 5 cm. across, always obovoid. Group VII.

ee. Figs less than 2 cm. in diameter, nearly all globose or subglobose.

f. Sprawling, subscandent or scandent; leaves smooth, with or without hairs. Group VIII.

ff. Erect shrubs, seldom trees; leaves harsh at least beneath. .... Group IX.

fff. Erect shrubs or trees; leaves smooth not harsh, with or without hairs.

g. Leaves 2 to 3 dm. long, one half as wide. .... Group X.

gg. Leaves smaller.

h. Leaves hairy beneath; fruits densely pubescent. .... Group XI.

hh. Leaves and fruits glabrous or subglabrous.

i. Leaves elliptic, numerously pinnatinerved. .... Group XII.

ii. Leaves cordately ovate, fewer nerved. .... Group XIII.

iii. Leaves oblong, not pinnatinerved.

j. Leaves coriaceous; figs soft skinned. .... Group XIV.

jj. Leaves chartaceous; figs hard skinned. .... Group XV.

Group II.

Ficus antoniana Elm. n. sp.

Subscandent and epiphytic; stem flattish, 1 dm. thick, irregularly branched toward the base, usually giving rise to a few thick main branches near the base; wood sappy white, soft, porous, without odor or taste; bark yellowish brown or greenish, smooth, green beneath the epidermis, the minor portion whitish and with very little latex; main branches long, horizontally spreading, about 5 cm. thick and 5 m. long, branched all along, the

ultimate ones lax and somewhat drooping, their tips glabrous. Leaves alternatingly scattered along the branchlets, glabrous, quite rigid, easily breaking, flat with recurved tips, horizontally spreading, lucid above, much paler green beneath, drying greenish, entire, perceptibly inequilateral, oblanceolately oblong, 1 dm. long, 3.5 cm. wide above the middle, apex sharply acute, cuneate or gradually tapering from above the middle to the base; midvein prominently raised and whitish beneath, the 6 to 9 lateral primary ones ascending especially the basal pair which runs submarginally, conspicuous, their ends strongly united; the secondary nerves also prominent, reticulations relatively so, all yellowish white and conspicuous in comparison to the brown interspaces; petiole usually yellowish brown scurfy, 7.5 mm. long; bud bract 5 mm. long, glabrous, brown, sharply pointed.

Receptacles erect from the leaf axils, solitary in pairs or in small clusters, globose except the truncate apex, hard, smooth, luteus and occasionally shaded with aurantiacus, 7.5 mm. across; peduncle 5 mm. long, glabrous, similarly colored, subtended at the base by a whorl of small subglabrous bracts; umbilicus circularly marked, not raised, the aperture guarded by the tips of the inner scales; flowers apparently all fertile female, 3 mm. long, glabrous, some younger ones or undeveloped ones mixed in between the mature flowers, pale yellow; pedicel 1 mm. long, oblique; perianth exceeding the ovary, hyaline, splitting into 2 or 3 parts nearly to the base; ovary subreniform, 1.5 mm. long, somewhat compressed, pale yellowish brown, smooth, hyaline crested; style smooth, 1.5 mm. long, hyaline toward the base, lateral or sublateral, deep brown otherwise, bearing a slightly enlarged oblique stigma.

Type specimen 12831, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This sprawling or subscandent epiphyte grew about the base of a large tree trunk upon stony soil of wooded banks of the Iwahig river at 750 feet. Name after our son *Anton Dambor.*

Of this unique species I found only a single plant and is very close to *F. warburgii Elm.* but not the same species. The following are some of the chief differences. Leaves larger, distinctly cuneate at the base, inequilateral, with a sharp pointed apex, lateral nerves more curving and forming a stout submarginal vein, with coarser reticulations and the under side of

our young leaves are not tessellate as they are on my *F. warburgii.* The branches of our Palawan plant are smooth and grayish white, on the Lucban plant they are reddish brown. There are also some floral differences. Possibly both of these two closely allied species should be referred under *Synoecia* of *Dr. King's* monograph.

Group III.

Ficus corona King.

Field-note:—A small or middle sized suberect tree; stem 6 inches thick, occasionally 2 or 3 from the same base, subterete, 20 feet high, branched from below the middle; main branches ascending, ultimately recurved, numerously and laxly rebranched, the short twigs suberect; wood soft, pulpy, white, light, entirely without odor or taste; bark smooth, grayish white cremeus except the epidermis; leaves mostly descending, submembranous, pale green, still paler beneath, flat or slightly conduplicate, diverse; figs pendant, upon flexible branched tubercles a foot or a yard long, obovoid, 0.75 inch long, dark green, not hard, upon greenish peduncles, rugose toward the apex, sprinkled with brown lenticels; tubercles as well as the twigs caesius or subglaucus green; flowers yellowish or light molasses brown.

Represented by number 13085, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in slightly wooded gravelly flats along the Balsahan river at 100 feet and at the base of the foothills. Only known from Palawan and Mindoro of the Philippines.

Ficus merrittii Merr.

Field-note:—A short tree; stem crooked, 1.5 foot thick, buttressed near the ground, branched from below the middle, 20 feet high or higher; wood dirty white, soft, winged, without taste or odor; bark smoothish, mottled, freely bleeding with a white sap; branches spreading, the ultimate ones suberect and dull brown; leaves nearly flat, with recurved tips, sub-

chartaceous, much darker green above, the veins beneath yellowish white; petioles scurfy brown, quite flexible; infrutescence along the stem and larger branches, upon 1 to 2 feet long pendant ligneous flexible tubercles which are numerously rebranched, dark brown in color and more or less ringed; peduncle green, descending; figs obovoidly globose, at least 1 inch across, hard, shining green but provided with brown lenticels which have whitish borders, umbilicus greenish; flowers brownish or whitish.

Represented by number 12669, *Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

This tree stood in black moist soil mixed with fine gravel of woods bordering swampy places at 25 feet altitude. The Tagbanuas call it "Tabog."

Not typical *F. merrittii Merr.* yet apparently more closely related to it than to *F. nota (Blco.) Merr.*

Group IV.

Ficus heteropoda Miq.

Field-note:—Small erect tree; stem 6 inches thick, terete, 25 feet high, somewhat crooked, branched at the top; wood very soft and pulpy, coarsely ringed, dingy white, without odor or taste; bark yellowish brown mottled, hypodermis green, otherwise whitish; main branches ascending, relatively short, numerously rebranched; twigs brownish, also short, suberect, forming a small dense crown; figs in dense cauline clusters, from very short branched woody tubercles, peduncles pale green, the fruits at least 0.5 inch thick, subglobose, rough, only the umbilical scales purplish tinged, otherwise aurantiacus or when fully ripe softer and more red.

Represented by number 13070, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In moist soil of lightly wooded benches near the Tagbuli creek at 50 feet altitude. Very characteristic, both in habit and place of growth.

Ficus sulcata Elm. n. sp.

Shrub; stem when solitary 5 cm. thick, in ours there were

a few stems from the same root cluster and only 2 to 5 cm. thick, 3 to 5 m. high, ascending, branched from below the middle; wood soft, whitish, odorless and tasteless, with a large pith; bark smooth, gray, with but very little latex; branches slender, the ultimate ones ascending, the tips green and hispidly covered with hairs dirty brown in color. Leaves usually opposite, toward the ends of the twigs, mainly horizontal, flat with recurved tips, paler green beneath, chartaceous, diverse in size, oblanceolately oblong, apex abruptly acuminate, base rounded or subauriculate when dry, grayish black on the upper scabrous and minutely hispid surface, brown on the less scabrid and more pubescent nether side, the average blade nearly 2 dm. long and 7.5 cm. wide above the middle, below the middle gradually narrowed, entire except the fine serrulations toward and at the apex; midvein conspicuous beneath, with 7 to 9 ascendingly curved lateral nerves on each side, cross bars relatively obscure, all densely covered with hispid hairs; stipules persistent, thin, brown, acuminate, 2 cm. long by 7.5 mm. wide at the base, only the middle dorsal portion hairy; bud bracts similar; petiole at least 1.5 cm. long or equalling the stipules, striate, densely hispid.

Receptacle forming dense fascicles along the stem chiefly, although occasionally occurring upon the exposed roots; clusters diverse, from 5 to 20 cm. across, bearing a few figs or dense masses of them; tubercles branched, rather thick, quite rigid, roughened with rings and dry scales; fruits dark blood red on the outside of dense clusters, light red on their inner sides, obovoid in outline, cuneately tapering at the base, 2.5 cm. across, sparsely sprinkled with whitish lenticels, conspicuously ridged or sulcate from base to apex which is truncate and sunken and has minor ridges connecting the main ridges with the umbilicus, only sparsely provided with whitish hispid hairs; peduncle more densely hispid, at the base subtended by a whorl of bract-like scales, at the apex bearing 3 short acute bracts, 5 to 8 mm. long; umbilicus sunken or at least not raised, radially rugose, covered with flat scales, the inner scales broadly ovate and submembranous; flowers male and gall only; male flowers quite numerous around the umbilicus, monandrous, the subgamophyllous perianth reddish brown and completely encasing the anther which is ovately cordate in shape and nearly 1 mm. in length; gall flowers scattered, 4 mm. long, upon 2 mm. long pedicels; perianth reddish

brown, subtending the similarly colored ovary, subhyaline, less than 1 mm. long, broad and subtruncate, splitting down to the base on one side; gall ovary smooth, 1.5 mm. long; style lateral short, obliquely extending, bearing a small expanded stigmatic portion.

Type specimen 12686, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Discovered in black compact humus covered soil of woods interspersed with cogon grass at 25 feet altitude. A few dwarfed shrubs of this species, without fruits, were also observed in the vicinity of Puerto Princesa. The fruits, a day after collecting still contained a great deal of clear water, which could easily be pressed through the umbilicus in a fine stream 5 dm. long. The Tagbanuas call it "Nududalug."

A remarkably distinct species from all other Philippine figs, the characters of its foliage reminding one of *F. minahassae Miq.*

Group V.

Ficus indica gelderi (Miq.) King.

Field-note:—A straggling epiphyte; stems 3 or more, rather slender and widely spreading, 10 feet long, 2 inches thick, repeatedly branched, terete; branchlets lax, relatively short, the tips ascending; wood soft, odorless and tasteless, whiter on the outside, finely ringed concentrically; bark grayish or yellowish white, more or less lenticelled, reddish brown except the epidermis, its latex viscid; leaves rigidly chartaceous, flat except the slightly recurved tips, a trifle paler green beneath; figs solitary or 2 or 3-clustered, ellipsoid, less than 0.5 inch long, smooth, pale green, ultimately ruber red especially about the umbilicus.

Represented by number 12728, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Upon the axils of the lower limbs of a middle sized tree along a thinly wooded streamlet at 250 feet, with its limbs reaching out over the creek.

The fruits are more similar than the leaves to my number 9384 from Lucban and which was distributed under this same

name. It really ought to be referred to *F. gelderi Miq.*, that is, if our Philippine plant is exactly what *Miquel* had in mind, for it is reasonably distinct from our Philippine *F. indica Linn.*

Ficus palawanensis Merr.

Field-note:—An inclining tree; stem usually solitary but occasionally few, 1 foot thick, 30 feet long, subterete, branched from near the base; branchlets slender, horizontally spreading or drooping, only sparingly rebranched, tips suberect; wood quite tough, the outer 2 inches white and which abruptly changes to the incarnatus greater central mass, odorless and without taste; bark thick, grayish white blotched on the surface, brown in the middle region, yellowish upon exposure on the inner side, with latex; leaves rigidly chartaceous, slightly conduplicate on the upper and greener surface, veins beneath whitish or relatively so; figs in pairs from the leaf axils only, hard and ruber red, 0.75 inch long when fully ripe on the twigs in which state it becomes soft in texture and turns nearly purplish black except the ochraceus bract protected portion.

Represented by number 13009, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected on wooded banks of the Iwahig river at 250 feet altitude, in red soil with a gravelly or stony subsoil.

This species the writer has collected in middle Luzon, in the Visayan region, southern Mindanao, but nowhere was it seen in such abundance as in Palawan its topotype.

Ficus clusioides Miq.

Field-note:—Tree; trunk short, conspicuously wadded and buttressed at the base, giving rise to a few ascending and stem-like branches which far extend over the river bed and ultimately are numerously rebranched; twigs slender, greenish; wood soft, slightly tinged except the sapwood, ringed, nearly odorless and tasteless; bark with an abundance of latex, smooth, whitish except the brown inner side; leaves rigidly coriaceous, only shallowly folded upon the upper side, paler beneath; figs usually in pairs from the leaf axils, sessile, the large rigid bracts nearly flavus, when fully ripe soft, compressed globose, 2 cm. in diameter, smooth

and dark violaceus; in the younger state of a light shade of pink sprinkled with whitish spots, hard, with a slightly raised nearly smooth yellowish umbilicus; flowers dirty white.

Represented by number 12765, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

On a wooded gravelly bank of the Iwahig river at 500 feet altitude.

Ours is a good match for *Cuming* 1929, the type of *Miquel's* species. The young figs are more or less covered with the bracts.

Ficus iwahigensis Elm. n. sp.

A strangling climber; stem turning and twisting, tightly cleaving to its support, subterete, 8 cm. thick, suddenly branched 5 m. above ground; branches spreading, 3 feet long, repeatedly branched; branchlets slender, somewhat drooping, smooth, yellowish gray, with ascending tips; wood soft, porous, the greater outer portion melleus, the heartwood sordid, the concentric rings numerous and quite distinct, odorless and tasteless; bark grayish brown, roughened with blunt lenticels, otherwise testaceus except the sappy white inner side, latex abundant. Leaves alternatingly scattered along the twigs, horizontal or descending, flat or only the apex recurved, subcoriaceous, drying blackish brown, very unequal in size, elliptic oblong, entire, apex rather abruptly acute, base of the smaller blades obtuse, rounded on the larger ones, the average lamina 15 cm. long and one half as wide across the middle; midvein prominent, the 9 primary lateral pairs divergent, also conspicuous, the basal pair arising 3 mm. above the base and oblique, all interarching, reticulations rather numerous and quite evident; petiole stout, glabrous, 1 to 3 cm. long, caniculate along the upper side, easily becoming detached and leaving oval scars; bud bracts at least 1.5 cm. long, glabrous, sharply acuminate.

Receptacle in pairs of the leaf axils, hard, smooth, ruber red, 2 cm. long when fully grown, becoming nearly purplish black and soft on the twigs except the basal portion protected by the bracts which remain ochraceus, ellipsoid with truncate ends, sessile; bracts 3, rotately spreading, green, with yellowish margins, the middle basal portion slightly hairy, ridged or developed into an umbo, ovately elliptic, as long as 7.5 mm. long; umbil-

icus flat, minute, covered over with few rigid and flat scales; flowers of three distinct kind, male, gall and fertile female, more or less all scattered and intermixed; male monandrous, 4 mm. long, clavate, the dark reddish brown perianth entirely covering it, the 2 mm. long stipe nearly black and curved, eventually becoming 3-segmented; anther cordately ovate to elliptic, upon a very short dark colored stalk and attached to a similarly colored connective, the entire flower subtended by linear 1.5 mm. long involucral bracts; gall flowers similar, the involucral bracts splitting clear to the base into 2 or 3 oblanceolate segments; ovary ellipsoid, dark brown, 1.5 mm. long; style subterminal, straight or curved, nearly black, ending into an acutely pointed expanded oblique stigmatic shield; fertile female subsessile, the slender style and stigma as well as the short pedicel very deep brown, subtended by 3 to 5 rather broad and oblong 2 mm. long involucral bracts; ovary at least 1.5 mm. long, compressed, yellowish, truly lateral, oblong from the side view.

Type specimen 13008, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This young epiphyte was discovered in moist red soil with an unknown depth of gravelly subsoil on the wooded banks of the Iwahig river at 250 feet altitude. Like other species on the banks of water courses, its limbs far extend over the open space for light, air and no doubt the cooling effect of the water.

The leaf character would place this species with *F. chrysolepis Miq.* and *F. pruniformis Blm.*, the fruits are however more nearly related to *F. palawanensis Merr.* and allied species.

Ficus strangularis Elm. n. sp.

At first epiphytic, eventually developing into a tree-like form; stem irregular, forming an interlaced mass about its former support; main branches 3 dm. thick, ascending, ultimately numerously rebranched and widely spreading horizontally; wood finely grained, rather brittle, dingy or yellowish white, without odor or taste; bark grayish white, smoothish, the inner side sappy white and with scarcely any latex; twigs suberect, tough, glabrous, the young portion yellowish gray. Leaves alternate, mostly toward the ends of the bracteoles, horizontal or descending, coriaceous, shining deep green on the curvingly

folded upper surface, duller and much paler beneath, oblong or elliptic so, entire, curing blackish brown, acute to acuminate, base obtusely rounded or shallowly auriculate, very smooth and glabrous, the average blade 17.5 cm. long by 7.5 cm. wide across the middle; petiole 2 to 3 cm. long, stout, glabrous, caniculate along the upper side, easily becoming detached and leaving oval scars; midvein exceedingly pronounced on the under side, the straight 9 to 11 lateral pairs oblique especially the basal pair which arises 3 to 5 mm. above the base, tips interarching, all smooth and in the fresh state whitish, reticulations fine and relatively conspicuous; bud bract also glabrous, acuminate, nearly 1.5 cm. long or longer.

Receptacle usually solitary in the leaf axils below the foliage, descending, sessile, short ellipsoid, up to 3 cm. long, when fully mature soft and pale green or yellowish so with darker green papillae; subtended by one or more ring-like vestiges of green bracts; umbilicus smooth and minute; the centrally pointed scales brown, linear, 3 mm. long, with truncate tips; flowers apparently only fertile female and gall flowers mixed throughout; gall flowers upon stout 2 to 3 mm. long pedicels, the reddish brown perianth covering the ovary but finally splitting into 3 segments; the gall ovary ellipsoid, very sordid, bearing along its side a short shriveled style; fertile female upon shorter pedicels, loosely surrounded by a 2 or 3-segmented perianth of unequal lengths; ovary bright yellowish brown, oblongish ellipsoid or subreniform, 2 mm. long, smooth; style attached at the middle on a side, crustaceous, 2 to 3 mm. long,the shriveled stigmatic portion dark brown.

Type specimen 12956, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This is one of the powerful strangling fig cleavers in the Philippines. They all start as epiphytes from seed disseminated by birds or monkeys and begin growing in some favorable lodging place such as the moist humus covered axils of the lower limbs of moderately large trees. During the first period of its life it is distinctly recognized as an epiphyte. It developes into several widely spreading limbs for air and light, and its basal or root portion grows downward into several root stems, irregularly and promiscuously about the trunk of its host or support until the humid ground is reached. Then they strike roots

and stoutly graft themselves into the soil in a tree-like fashion. The interlaced united tree trunk about its host becomes stronger and near the ground often becomes reinforced with buttresses. Gradually its living host is strangled to death standing, since the epiphyte has grown into a stout tree-like form itself. In this state it appears as a tree with an irregular trunk.

Group VII.

Ficus garciae Elm.

Field-note:—Medium sized erect tree; stem 1.5 foot thick, 40 feet high, terete, nearly straight; wood very soft or pulpy, odorless and nearly tasteless, whitish but the central mass slightly tinged with roseus; bark thick, the middle portion roseus, the inner whitish layer with an abundance of latex, the gray epidermis covered with numerous circular and flattish rather large brown excrescences; branches chiefly at the top, numerously rebranched and forming a flattish crown; twigs ascending, greenish brown and soft; blades upon ascending petioles, descending, flat or shallowly folded upon the upper very deep lucid green surface, tips recurved; figs clustered and hanging upon stout sparingly branched tubercles less than 6 inches long; peduncles dull green, very lax and limp, at least 3 inches long; syconium obovoidly globose, 1 inch across, green and becoming streaked with pale red; florets brown.

Represented by number 12846, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found standing in a stone gravelly creek bed at 1500 feet, whose steep mountain sides were heavily forested.

Group VIII.

Ficus celebica Miq.

Field-note:—Twining epiphytes near the ground; stem 2 inches thick, terete, usually more than one from the base, slender and spreading, 10 feet long, freely branched all along; twigs

laxly spreading, yellowish, the young portion covered with brown hairs; wood dingy white, odorless and tasteless, distinctly grained; bark greenish gray, smooth, rather thin, with latex; leaves membranous, few, slightly recurved toward their apices, paler green beneath; figs globose, clustered along the branchlets, hard and stramineus, papillate except the dark green umbilical portion, 0.25 inch in diameter, soft and ochraceus when mature, flowers pale white.

Represented by number 12772, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This scandent low ground epiphyte was gathered in humus covered red soil with a stony or gravelly subsoil in dense woods near the Iwahig river at 500 feet.

Ficus copelandii C. B. Rob.

Field-note:—A slender spreading shrub; stem 2 inches thick, 10 to 15 feet long, occasionally few from the same root cluster, suberect or reclining, branched all along; the slender flexible twigs suberect; wood whitish, odorless and tasteless, finely yet distinctly ringed, moderately soft; bark also whitish beneath the smooth yellowish brown epidermis, the inner part contains a trifle latex; leaves horizontal or descending, flat, tips recurved, very much paler green beneath, chartaceous; figs chiefly along the branchlets though also in the lowermost leaf axils, globose, 7.5 mm. in diameter, dark green and with paler green or yellowish white spots, when ripe soft and aurantiacus; its flowers deep red.

Represented by number 12830, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in stony or gravelly soil along the Iwahig river banks densely covered with trees and vines at 750 feet altitude.

Ours is quite typical except for the slightly narrower leaves. *F. copelandii C. B. Rob.* is common on the Zamboanga peninsula and this collection represents the first found outside of that district.

Ficus pisifera Wall.

Field-note:—A stocky tree; trunk 1.5 foot thick, 25 feet high, rather crooked, branched from below the middle, not

terete; branches widely spreading, the ultimate ones quite slender and not at all numerous; wood yellowish white, moderately soft, odorless, nearly tasteless, with conspicuous concentric rings; bark smoothish, yellowish blotched, freely bleeding with latex; leaves chartaceous, horizontal and somewhat recurved, nearly flat, dark green above, paler on the nether side; figs in fascicles, chiefly along the branchlets, hard, yellow except the greenish apical portion, very numerous, the inside whitish except the pink tipped umbilical scales.

Represented by number 12664, *Elmer*, Brooks Point (Addison Peak), Palawan, March, 1911.

Collected in wet soil of woods bordering sparse mangrove swamps at 15 feet altitude. The natives or Tagbanuas call it "Cayoyobang."

This is more typical than I have ever collected and in the field it has quite a distinct habit, differing from my previously collected specimens distributed under this same name. The leaves on our material average somewhat larger than on *Wallich's* specimen.

Ficus recurva Blm.

Field-note:—A fine small tree trunk climber; stem terete, flexible, 0.5 inch thick, attached to its support, terminating with a few long branches, 20 feet from the ground; branchlets slender, drooping, curved, ascending toward their tips; leaves roughened beneath beside being finely pubescent, diverse, margins more or less recurved, alternate, horizontal, recurved toward the apex, chartaceous, nearly flat or shallowly conduplicate on the upper darker green surface; wood porous, whitish, no odor nor taste; bark grayish white, more or less ringed and minutely lenticelled, relatively thick, the hypodermis green, the inside sappy white, apparently without latex; figs in small groups of the fallen leaf axils along the branchlets, upon ascending yellow stalks, globose, luteus to aurantiacus except the slightly purple tinged umbilical scales, rather dry and rough, not hard nor soft, the apex slightly sunken, otherwise globose, 0.25 to 0.33 inch in diameter; flowers much paler yellow.

Represented by number 13072, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

This unique species was discovered in fertile humid forests at 750 feet altitude, on the trail to Napsan which is a small settlement on the west coast of middle Palawan.

Quite typical of *Blumes'* Javan species which is here for the first time collected and reported from our archipelago.

Ficus confusa Elm.

Field-note:—A sprawling and subscandent shrub; stems several, 1 to 2 inches thick, branched from their bases, 10 to 25 feet long; branches freely rebranched, slender, lax, horizontally spreading or drooping, forming an interlaced net work; wood rather hard, finely grained, whitish, without odor or taste; bark easily stripping, tough, grayish brown, very smooth, green beneath the epidermis, otherwise whitish, apparently without latex; leaves descending, nearly flat, tips recurved, pleasing green except the old dark green ones, submembranous, the larger veins whitish beneath, diverse in size, usually the larger blades terminal; figs hard, luteus to aurantiacus, perfectly globose, less than 0.5 inch in diameter, solitary or in pairs from the leaf axils, upon short greenish recurved peduncles; florets nearly of the same color.

Represented by number 12845, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Upon a huge bowlder lying in a creek bed at 1500 feet altitude and where the dense forests from both mountain sides entirely covered the steep water course.

Again I report this under my name rather than under *F. philippinensis Miq.* whose name is antedated by *F. philipinense Hort.* I do not doubt that my number 8004 from Twin Peaks is identical with 1937 *Cuming*, but I do doubt whether our particular plant in hand is the same. It has leaves and bud bracts two to three times as large.

Ficus tayabensis Elm.

Field-note:—A large tree climber; stem subterete, 2 inches thick, bendable, branched at the top only; branches numerously rebranched and forming interlaced masses, grayish white, the subflexible twigs ascendingly curved; wood soft, with large pores,

the outer portion dingy or yellowish white, the central dull incarnatus, odorless and tasteless; bark reddish beneath the dull ardiseus or blackish smoothish epidermis, the whitish inner surface contains a flow of latex; leaves horizontal or descending, chartaceous shining deep green on the upper shallowly folded surface, much lighter green on the nether side, the prominent veins beneath yellowish, tips strongly recurved; the petiole testaceus; figs solitary or in pairs from the leaf axils or in their scars, upon greenish recurved peduncles, ruber red, the syconium yellow, so are also the flowers with only a tinge of red, subglobose or globose, with ends somewhat flattened, 7.5 mm. in diameter.

Represented by number 13045, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

A liana-like vine in rich moist forested flats at 250 feet altitude.

This is the first time it has been rediscovered. It seems to be related to *F. ramentacea Roxb.*

Group XI.

Ficus celtoides Elm. n. sp.

Erect shrub; stem 1 dm. thick, 3 m. high, subterete, crooked, its main branches arising from the middle; wood moderately hard, sordid, odorless and without taste, finely ringed; bark smooth, gray and brown mottled; branches widely spreading, numerously and crookedly rebranched, the lax or rather slender twigs erect or nearly so, the young portion subscabrous. Leaves alternate or occasionally opposite, ascending, apical portion recurved, only a trifle paler green beneath, very scabrous on both sides, drying green, chartaceous, oblongish, usually acuminate at apex, base roundly obtuse, margins toward the base usually entire, otherwise irregularly dentate and occasionally with shallow sinuate lobules, the larger blades 1 dm. long by 4 cm. wide a trifle above the middle, copious and frequently much smaller, glabrous; midvein prominent, with 5 to 7 primary lateral pairs, all strongly oblique especially the basal pair, with their tips anastomosing, coarse, cross bars or reticulations rel-

atively conspicuous; petiole dull brown in the dry state, scabrid, 7.5 mm. long; bud bracts setae-like, less than 5 mm. long, smooth or slightly scaberulous, brown.

Receptacle solitary or in small groups, scattered along the branchlets or in the leaf axils, hispid, globose or more elongated, 7.5 mm. in diameter, pale latericius, becoming quite soft with maturity; peduncle 3 mm. long, subtended at the base by minute bract-like scales, at the distal end or upon the basal portion of the receptacle provided with a few short broad bracts; umbilicus circular and a trifle raised, set in upon the depressed or sunken apical portion of the fruit, the inner scales short and hyaline; flowers male and gall only; the male in a circle beneath the umbilical scales, upon short pedicels, 2 mm. long, monandrous; perianth segments opening down to below the anther into 3 nearly equal parts, scarcely exceeding 1 mm., very hyaline; anther pale yellow, broadly elliptic, 0.75 mm. long, emarginate at apex, bilobed at base; gall flowers scattered, similar; ovary yellowish, smooth, bluntly ellipsoid, 1 mm. across; style subterminal, whitish, short, bearing a small brown stigma.

Type specimen 12796, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This was found growing near a woodland stream in dry gravelly soil among bowlders at 250 feet altitude.

It certainly cannot be referred to the low or creeping shrub which *King* discusses under *F. quercifolia humulis (Miq.)*. Neither is it from description *F. sinuosa Miq.* nor *F. inconstans Miq.*, the former of which is identical with *F. cumingii Miq.*, and both of which must be reduced to the older *F. ulmifolia Lam.* Also to be compared with *F. terminalifolia Elm.* from Sibuyan island. This group is the most difficult of our figs for correct interpretation we have in the Philippines, and a systematist without field knowledge can do nothing with a lot of herbarium material carelessly collected and to which are attached unreliable data.

Ficus pustulata Elm. n. sp.

A strictly erect shrub; stem terete, few to several from the same root cluster, 1 to 2 m. high, 1.5 cm. thick, flexible, branched chiefly toward the top; wood moderately hard, tough, white,

tasteless and odorless, with a green pith, ringed; bark smooth except the green hypodermis, easily stripping, the inner whitish portion without latex; branches ascending or suberect, numerous, slender, greenish to brown, even the young portion smoothish and glabrous. Leaves smooth, alternatingly scattered, copious, coriaceous, flat with strongly recurved apices, paler green beneath, drying dull brown, pandurate, the average blades 7.5 cm. long, 3 cm. wide above the middle, abruptly constricted across the middle, apex acute, base obtuse or roundly so, entire, glabrous, in general outline oblanceolately oblong; petiole ascending, 1.5 cm. long, olivaceus and occasionally brown scurfy; midvein quite prominent beneath and whitish when fresh, blackish brown when dry; lateral nerves 3 to 5 pairs, the basal pair running parallel with the margin, the 2 or 3 other pairs mainly from above the middle, ascendingly curved especially toward their apices, reticulation coarse and obscure, all glabrous; bud bracts well under 1 cm. long, sharply acuminate, brown, smooth and glabrous.

Receptacle usually solitary in the leaf axils or in the axils of the fallen leaves, divaricate, glabrous in all stages, perfectly glaucus green when young which are more elongated than ovoidly subglobose, at all times conspicuously rugose or verrucose or pustulate, toward maturity nearly flavus and ultimately becoming deep strawberry red while still attached to the plant, at all stages rather soft in texture and full of latex, 1.5 cm. long, 1.25 cm. thick below the middle; peduncle very short, at the distal end provided by 3 small bracts; umbilicus conically raised or abruptly constricted into a circular cone, nearly smooth, purplish even in the young state, covered over by flat scales, chiefly arising from the outside, the inner ones quite similar although thinner in texture; flowers gall and male only; male flowers mostly in the upper one half of the syconium although scattered clear to the base, diandrous; pedicels at least 2 mm. long, weak, hyaline; perianth segments 3 or 4, free, deep reddish brown, 1.5 mm. long, oblanceolate, deeply folded upon the ventral side; anthers yellowish, nearly 1 mm. long, oblong, ends truncate, at the base at least emarginate; gall flowers mostly in the lower one half although scattered in the upper region as well, 2.5 mm. long; perianth longer and more sharply pointed, free nearly to the base; pedicel 1 mm. long, slender, pale yellow;

gall ovary smooth, straw color, as long as its pedicel, ellipsoid. bearing a short subterminal brown style.

Type specimen 12874, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in dry copses in compact soil over stony or gravelly subsoil at 250 feet or less in altitude.

Ficus cardinalicarpa Elm. n. sp.

Strictly erect and shrubby; stems branched above the middle, 1.5 m. high, solitary or few clustered, 1.5 cm. thick, terete, flexible; wood quite hard, tough, whitish except the greenish pith, ringed; bark very smooth, whitish on the inner side, the hypodermis greenish brown on the surface especially so on the branchlets; branches ascending, quite numerous, lax, glabrous and smooth even the young parts, with but little latex. Leaves alternatingly scattered along the branchlets, coriaceous, linear to lanceolate, diverse in size, paler or subglaucus green beneath, drying dull brown or blackish, entire, glabrous not scabrous, margins subinvolute, the larger blades 1 dm. long by 1.5 cm. wide below the middle, slenderly tapering to the acuminate point, base roundly obtuse; midvein whitish when fresh, blackish brown when dry; the basal pair of lateral ones running submarginally and connecting with the other 7 to 13 divaricate lateral ones which are much less conspicuous, reticulations nearly obsolete; petiole ascending, glaucus green, glabrous, becoming scurfy brown, 1 cm. long; stipule or bud bract 7.5 mm. long, brown, glabrous, sharply pointed, deciduous.

Receptacle solitary or at most in pairs from the leaf axils, ovoidly globose or ellipsoid, 1 to 1.5 cm. long, glabrous and subglaucus in appearance, strongly verrucose, the apical portion or the umbilical region much constricted, terete, soft and deep pleasing red in the mature state; peduncle less than 3 mm. long, recurved, glabrous, bearing at its distal end 3 minute bracts; umbilicus conically raised, circular, bordered by a cartilaginous ring, aperture covered over by short flat scales, the inner overlapping scales broad for their length; flowers numerous, male and gall only; the male scattered in the upper one half of the syconium, diandrous; pedicel 2 mm. long, weak, hyaline; perianth segments free, reddish brown, spoon shaped, less than 1 mm. long;

3 or more anthers upon hyaline short stalks, yellowish, strongly curved, broadly oblong, ends truncate and notched, about 1 mm. long; gall flowers scattered throughout but especially numerous in the lower one half of the syconium, 2 mm. long, subsessile or upon a 0.5 mm. long pedicel, subtended by usually 3 acuminate reddish brown free perianth segments 1.5 mm. in length; gall very smooth, 1 mm. long, yellow, ellipsoid, bearing a stubby lateral style.

Type specimen 12875, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911; also number 12876 from the same locality.

This species grows under the same ecological condition as the preceding, in shallow red soil or usually in gravelly flats of slight woods or in shrubberies at 200 feet.

The author examined a good many shrubs of both this and the preceding species, but never could I detect the two very distinct forms of leaves on the same bush. In fact number 12876 is the widest leaved form found and it distinctly belongs here. The fruits, stature, place of growth and even the texture of the leaves are exactly the same in the three numbers collected and which represent two quite distinct species different from any other known *Ficus*.

Ficus ampelas Burm.

Field-note:—Small erect tree; stem 8 inches thick, terete, crooked, 25 feet high, its main branches arising from below the middle; branchlets numerous, slender, fine and lax, usually drooping; wood odorless and tasteless, rather soft, whitish, with coarse rings; bark smooth, grayish white mottled, the middle region yellowish, the inner side white and apparently without latex; leaves rigidly chartaceous, horizontal or descending, folded upon the upper dark green surface, recurved toward the apex; figs solitary or in axillary pairs, upon greenish and ascending pedicels which turn yellow with age, flatly globose, apex sunken, hispid even in its mature citrinus state, with the small umbilical scales pink; flowers pale or greenish white, green in the young state.

Represented by number 13087, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Gathered from among shrubs or slightly wooded banks of a small nearly stagnant stream winding about in the cogon flats at 25 feet altitude.

Ficus infectoria Roxb.

Field-note:—An epiphytic tree; trunk short, solitary or 3 or 4-grouped, ascending, soon widely spreading especially over the open river space; main branches 1 foot thick, 30 feet long, arising from below the middle, terete, the ultimate ones lax and drooping; wood very soft and fibrous, dirty white, without odor or taste; bark very smooth on the gray with brown blotched epidermis, testaceus otherwise, containing a flow of latex; leaves descending, coriaceous, very deep green and very lucid on the upper shallowly folded surface, margins somewhat wavy, the apex abruptly recurved on the nether side, much lighter green beneath; figs solitary or in pairs, in the leaf axils or from their scars, subglobose but with a flattened apex, pale green, with lighter colored milk spots; the syconium is hard, enclosing yellowish brown florets.

Represented by number 13002, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

On the densely wooded and moist sand gravelly banks of the Iwahig river at 500 feet altitude. Apparently this plant started as an epiphyte near the base of some tree trunk. When young it is more distinctly an epiphyte but usually develops into a spreading irregular tree form.

This species is more typical *F. infectoria Roxb.* than the variety *F. infectoria forbesii (Miq.) King*, both of which have sessile fruits. Most of our Philippine material has pedicelled fruits.

Group XI.

Ficus glareosa Elm. n. sp.

Slender suberect shrub or becoming tree-like; stem nearly 5 cm. thick, 5 m. high, only sparingly branched from above the middle; wood conspicuously grained, moderately hard and

heavy, odorless and tasteless; bark thin, more or less provided with small grayish white flakes, brown lenticelled, green beneath the epidermis, with only a little watery latex; twigs lax, not numerous, the young portion covered with short deciduous hairs. Leaves alternate, mostly toward the ends of the twigs, chartaceous, brown when dry, ascending, recurved especially toward the tips, deeper green above, panduriform or oblanceolate, oblongish, diverse in size, the larger blades 17.5 cm. long by 5 cm. wide well above the middle toward the apex, abruptly acute at apex, the basal two thirds conspicuously narrowed, obtusely rounded at the base, entire, margins subinvolute in the dry state, scabrous on both sides especially on the grayish upper surface; midvein prominent beneath, the lateral nerves below the middle short and divaricate, the upper ones oblique and curved toward their ends, 9 to 13 lateral pairs from base to apex, all densely hairy, reticulations relatively obscure; petioles 1 to 2 cm. long, pubescent, fluted along the upper side; bud bracts or stipules deciduous, nearly 1 cm. long, brown, glabrous, sharply acuminate.

Receptacles solitary or in pairs from the leaf axils, in shape ovoidly elongated, densely covered with grayish white hairs, pale green and with small milk spots, becoming soft and purpureus and even jet black while still on the plant, about 1.5 cm. long, 1 cm. thick a trifle below the middle, sessile, usually subtended by 3 short hairy bracts, more elongated in the young state; umbilicus abruptly constricted into a flattened cone, more densely pubescent except the purplish tips of the inner slightly protruding scales, the inner transverse ones broad and irregular in shape; flowers gall and male only; the male flowers in the upper region of the syconium although occasional ones are found below the middle, mostly diandrous but some in the same fruit have 3 anthers, nearly 3 mm. long, the thin pedicel 0.75 mm. long; perianth of 3 or 4 free segments, reddish brown when dry, purple when fresh, spoon shaped or more pointed, 1.5 mm. long, attached 0.5 mm. below the anther; anther yellow, 1 mm. long, about as broad, notched at both ends, upon 0.5 mm. long stalks; gall flowers similar except the perianth segments are longer and more acute; its ovary subglobose or short ellipsoid, shining smooth; style sublateral, short, bearing a deep brown recurved stigma.

Type specimen 12736, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911; also numbers 12986 and 13115 of the same locality.

A somewhat variable shrub confined to dry gravelly soil or in stony soil with a shallow sheat of red clay over it. The figs of this species turn plumb black when fully ripe even before becoming detached from the plant.

In the same group with *F. macropoda Miq.* and *F. luzonensis Merr.*

Group XIV.

Ficus hauili Blco.

Field-note:—Small shrub-like tree; stem 8 inches thick, 20 feet high, branched from near the base; wood dingy white, odorless, slightly sweet, with numerous concentric rings; bark whitish, very smooth; the main branches ascending, ultimately widely spreading and copiously rebranched, twigs suberect; petioles becoming brown; leaves ascending, coriaceous, shining deep green on the upper usually curved surface, paler beneath, its main veins whitish; figs in pairs from the leaf axils, suberect, upon stout more or less angular and green peduncles, 2 cm. across, flattened at both ends, ridged especially from the apex downwards, the upper portion green, dark green about the umbilicus, the basal portion becomes whitish, densely covered with white or brownish white spots; flowers sappy white.

Represented by number 13226, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

In sand gravelly soil of the wooded banks of the Iwahig river at 500 feet.

This species is a characteristic shrub throughout the Philippines and its altitudinal range extends from the seacoast up throughout the foothills.

Ficus laevicarpa Elm. n. sp.

A low shrub-like tree; stem at least 1 dm. thick, 5 m. high, branched into main widely spreading branches from near the base; wood moderately soft, dingy white, closely though con-

spicuously grained, odorless and tasteless; bark quite thick, grayish brown, roughened with numerous blunt excrescences, the inner layer contains latex; branches freely rebranched, the ultimate ones rather slender and with suberect tips, the young portion finely scurfy. Leaves few, flat except the recurved tips, thinly coriaceous, very dark deep green above, much paler green beneath, horizontally spreading, strongly whitish nerved on the under side, alternate, usually toward the ends of the twigs, drying brown, entire, abruptly acute at apex, oblong or elliptic, with the widest portion above the middle, base obtuse or rounded and usually perceptibly inequilateral, of diverse sizes, the larger blades 2 dm. long, one half that across the widest portion; lateral nerves 5 to 8 on a side, oblique, rather straight, brown and smooth, less prominent than the midvein, the basal pair more oblique and subopposite, cross bars faint; petiole 1 to 3 cm. long, also glabrous, becoming gray when old, stout; bud bracts 2.5 cm. long, quite broad below the middle, the apical portion slenderly acuminate, brown, cinereous on the back.

Receptacle in pairs and pendant from the uppermost leaf axils, occasionally grouped upon very short tubercles along the under side of the larger branches, obovoidly ellipsoid but more tapering toward base, 2.5 cm. long, shining deep green especially so toward the apex, spotted with milk spots; peduncle similar in color, 1.5 cm. long, at the distal end provided with 3 sharply triangularly brown bracts up to 5 mm. long; umbilicus abruptly raised, circular, provided with imbricately arranged tips of the inner bracts, the inner ones obcuneate with subhyaline margins and a conspicuous brown midvein; flowers apparently male and gall only; male flowers arranged in a few concentric rows immediately beneath the umbilical scales, monandrous, 2 mm. long, the pedicel one half of that length, the light brown perianth covering the anther ultimately becoming 3-segmented; anther oblong, 1 mm. long, curved, attached to a short thick dark brown connective stalk; gall pedicels 1.5 mm. long, slender, reddish brown; ovary about as long, similarly colored, obovoidly ellipsoid with a short oblique style bearing an expanded stigmatic portion, the younger or undeveloped flowers shorter, with longer styles and compressed ovaries.

Type specimen 12776, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Only once seen in stone gravelly soil along the densely wooded banks of the Iwahig river at 750 feet.

It is a very striking species and comes nearest to *F. hauili Blco.* as far as our Philippine species are concerned.

Group XV.

Ficus crassitora Elm.

Field-note:—A slender erect tree; stem 6 inches thick, terete, 15 feet high or higher, its main branches arising from below the middle; wood moderately hard, dingy white, ringed, without odor or taste; bark smooth, whitish mottled, the white inner surface almost without latex, the larger branches numerously rebranched, the ascendingly curved twigs lax and quite slender; petiole brownish, dark green; leaves ascending or horizontal, flat, dark green above, much lighter or yellowish green beneath, coriaceous, the slender acuminate bud bract occasionally purple tinged; figs solitary or in pairs from the leaf axils, suberect, in the young state shining and purplish sprinkled, when old soft, obovoidly globose, 0.75 inch long, green yet a trifle tinged with red.

Represented by number 12833, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in sandy soil near rocky river banks at 1000 feet.

This species with the long bud bracts and figs with thick rinds has only sparingly been collected in the Visayan region. It is usually found along water courses in the higher wooded region especially near cascades or waterfalls.

LEAFLETS OF PHILIPPINE BOTANY

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NOTES AND DESCRIPTIONS OF EUGENIA

By

A. D. E. Elmer

During the past three years the writer collected toward fifty different species of *Eugenia* in the mount Apo region of Mindanao, on the island of Sibuyan and in the middle portion of Palawan. In the vicinity of Apo alone were collected twenty two species, fourteen of which are in the following pages described as new. On the island of Sibuyan fourteen were collected, seven of them are new. And on Palawan ten out of the fifteen species prove to be novelties. Apo exceeds by far in number of species, partly due to the higher elevation with denser forests and possibly because of more time devoted to its exploration. Mount Giting-giting on Sibuyan is only a little higher than one half that of Apo and mount Pulgar of Palawan is quite a little less than one half of Apo's height. Yet the latter mountain has a greater percentage of novelties. A most remarkable incident of my recent Palawan collection is the fact that it contains only one of *Dr. Robinson's* six new Palawan species, and that despite the fact that both his and mine were collected practically during the same season though of different years.

Eugenia diplycosifolia C. B. Rob.

Field-note for 11346:—Gnarly tree; stem 20 feet high, 8 inches thick; wood hard; bark brown, scaling in plates; main branches from the middle, ultimately numerously branched;

leaves ascending, the tips as well as the margins strongly recurved, quite rigid, dark shining green above, duller and much lighter green beneath; inflorescence and infrutescence from the uppermost leaf axils, erect; the peduncle and calyx green; the 4 free petals light yellow; stamens and pistils also yellowish; fruits ovoid, shining, purplish, bearing fine brown stigmas.

Represented by numbers 11346, 11672 and 11673, *Elmer*, Todaya (Mt. Apo), Mindanao, August and September, 1909.

All three of my numbers were collected in cold moist moss laden elfinwoods toward the summit of mount Calelan above 8000 feet altitude. "Tonau" is the Bagobo name for all. This species is common in the soggy forested flats at 6000 feet and higher up on mount Apo. It is the only bark about Baclayan camp which is used for roof purposes. The small or middle sized trees are girdled, and the one half inch thick very pliable and tough bark can then be pulled off into slabs of different widths clear up to the lowermost limbs. These strips are laid double across the roof pieces with their inner smooth sides up and need no tieing. Such a roof will turn the heaviest of rains for a few months before repairing is necessary.

Eugenia aurea Elm. n. sp.

A stunted tree or shrub-like; wood tough, whitish, odorless and tasteless, reddish toward the center; bark gray and brownish, thinly checked; stem 7.5 cm. thick, 4 m. high; main branches crooked and widely spreading at the top, ultimately numerously and laxly rebranched; the twigs relatively short and terete, grayish or the young tips brown, densely provided with blackish brown lenticels or small excrescences. Leaves oppositely scattered along the branchlets, subcoriaceous, shining and darker green on the upper side, flat, the blunt acute to acuminate apex rather abrupt, base obtuse, the entire margins minutely involute in the dry state, horizontally spreading, 3 cm. long, 1.25 cm. wide across the middle, subelliptic to ovately oblongish, the smallest leaves scarcely one third as large, numerously black punctate on the lower ultimately glabrous side; midrib not stout, sparsely hairy along the nether side toward the base in the young state; lateral nerves still more inconspicuous, oblique, 7 to 9 on each side, united at their ends into a submarginal

faint line, reticulations obsolete; petiole comparatively covered with yellowish white strigose hairs. Infrutescence from the terminal or uppermost leaf axils, solitary or few clustered; peduncle very slender, 1 cm. long, divaricate and usually curved, subtended at the base by a subwhorl of unequal bracts, in the early state cinereous, prominently papillose, bearing a small cluster of fruits at the distal end; fruit ovoidly globose, sessile or subsessile, few clustered from the ends of the stalks, 5 mm. long, nearly as wide across the base, smooth, wine red when mature, crowned at the apex by 4 persistent glandular calyx teeth; segments 1.5 mm. long, obtuse, finely cinereous; stamens 15 to 20, unequal in length; filaments thread-like, golden yellow, glabrous, the longer ones 7.5 mm. long, abruptly expanded at the base, nearly straight and persistent; anthers dorsifixed, 0.25 mm. across, subglobose, the 2 cells well separated in anthesis, paler yellow; petals also 4, thin, obovate, narrowed into a basal claw, yellow, deciduous, few glandular punctate; style 5 to 6 mm. long, terete, fleshy, yellowish, bearing a small stigma; seeds 35, compressed, irregular in shape, finely or minutely punctate, ochraceus or darker when mature, 1.5 mm. across.

Type specimen 11253, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

On a moss laden forested ridge of mount Burebid at 3500 feet altitude. The Bagobos call it "Tonau."

Our specimens are matched by *Copeland* 1186 from mount Apo and with specimen marked "A" from mount Silay collected by *Whitford*. It is a critical segregate from *E. diplycosifolia* *C. B. Rob.* which species is abundant in the mount Apo region and is also known to the Bagobos by the same name. Our branchlets are lax and more slender; leaves thinner with less revolute margins, less conspicuously nerved and their ends more tapering especially toward the apex; stamens longer and seeds much more numerous.

Eugenia apoensis Elm. n. sp.

Tree; ultimate branches numerous, short, dense, erect or ascending, the green young portion glabrous. Leaves obscurely punctate beneath, opposite, quite numerous, very unequal in size, also glabrous, drying dull brown on both sides, subchartaceous

or rigidly coriaceous, the entire margins strongly curved upon the under side, the abruptly acute to an acuminate apex recurved, folded upon the upper bright green surface, much paler beneath, base acute to obtuse, the larger blades 9 cm. long by 4 cm. wide across the middle and oblongish or obovately so, frequently smaller and obovate or broadly lanceolate; midrib raised beneath, sunken on the upper side; lateral nerves relatively very faint, 7 to 9 pairs, oblique and slightly curved toward their ends, more or less archingly united 3 mm. from the edge, reticulations minute and obscure; petiole 5 to 8 mm. long, caniculate. Inflorescence caniculate, profuse, terminal and from the uppermost leaf axils, much exceeding the foliage, erect, 5 to 15 cm. long, branched from the base and usually subtended by small leaves; branches opposite, angular, thick, the basal or larger ones few, rebranched toward the distal ends, all articulate and subtended by very blunt rather conspicuous bracts with thin brown margins; flowers 3-clustered from the ends of the very short and thick ultimate branchlets, sessile, subtended by a whorl of similar bracts, odorless; calyx turbinate, 4.5 mm. long, nearly as wide at the top including the segments, obscurely angular, coarsely and obscurely punctate; segments 4, subequal, 2 mm. broad, 1.5 mm. high, ascending, persistent, few glandular punctate except toward the thin entire edge; petals imbricately overlaid, ultimately reflexed and early falling or calyptrately becoming detached, unequal in size and shape but usually rotund, veins and pellucid glands relatively few, 3 to 4 mm. across; stamens indefinite, inwardly bent in the early state; filament 5 mm. long, the inner ones somewhat shorter, subterete, gradually thickened toward the base, tips pointed; anthers 0.75 mm. long, ovoidly oblong or ellipsoid, dorsally attached in the sinus of the short basal lobes; style arising from the bottom of the thick calyx rim, 5 mm. long, terete, gradually tapering from the base to the minute capitate stigma.

Type specimen 11594, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

In the humid mount Apo forested basin at 6000 feet altitude.

Very near to *E. curtiflora Elm.* but inflorescence profuse, terminal and exceeding the foliage. Leaves more numerously and less prominently nerved. The flowers are also smaller.

Eugenia malagsam Elm. n. sp.

Tree, stem 4.5 dm. thick, 12. m. high; wood moderately hard, odorless and tasteless, sappy white at least the outer one half; bark smooth, yellowish gray; main branches spreading, the ultimate ones numerous and ascending, forming dense clusters, the young portion green and terete, glabrous, blackish brown when dry. Leaves ascending, glabrous, folded on the upper deep green surface, paler beneath, abruptly constricted into an acute to acuminate point, base obtuse or subcuneate, the entire margins subinvolute in the dry state, the larger blades 7.5 cm. long by nearly 3 cm. wide across the middle, oblong, frequently much smaller and lance shaped or oblanceolate, the upper surface shining nearly black, the nether side castaneus; midrib prominent beneath, only faintly grooved on the upper side; lateral nerves oblique, more evident from the lower side, many, at their ends united into a submarginal line, the fine reticulations nearly as prominent. Young inflorescense erect, green, varying from 5 to 13 cm. long, glabrous, freely rebranched from above the middle; peduncles usually 3, angular; the short branches very shortly rebranched toward their ends, all articulate, angular and subtended by small rigid obtusely or acutely pointed bracts; flowers or rather buds few clustered at the ends of the ultimate branchlets, similarly subtended by minute bracts, sessile, numerous; calyx smooth, green, subterete, 4 mm. long, turbinate, nearly 3 mm. across at the top, crown 4-apiculate; petals whitish, imbricately overlaid and forming a calyptrate hood 2.75 mm. in diameter, caducous; anthers indefinite, incurved in the bud state; filaments 2 mm. long more or less, filiform, subterete; anthers short, truncately oblong, 0.25 to 0.33 mm. long, attached on the back in the basal sinus; style terete, strict, nearly equalling the stamens; fruits densely clustered, heavy, obovoidly globose, sessile, 1.25 cm. long, light to dark shining red.

Type specimen 11838, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Discovered in red compact and well drained humus covered soil of a wooded ridge of mount Burebid at nearly 4000 feet altitude. This as well as other similar or closely allied species of *Eugenia* the Bagobos call "Malagsam."

Eugenia globosa Elm. n. sp.

Large tree; trunk 20 m. high, 1 m. thick; main branches ascending from above the middle, ultimately widely spreading, the ascending branchlets rather long, crooked, not numerously rebranched, terete; wood moderately hard, sappy white at least on the outside, odorless and without taste; bark smoothish, brown, gray on the branches. Leaves opposite, scattered along the rigid twigs, horizontal or somewhat descending, recurved toward the sharply acuminate tips, shallowly conduplicate on the upper very dark green and shining surface, much lighter and duller beneath, rigidly coriaceous or subchartaceous, curing dull brown on both sides, beneath minutely punctate, entire, base obtuse or rounded, oblong or ovately so, the normal blades 1.5 dm. long, nearly 6 cm. across the middle or a trifle below it; midvein very pronounced, only shallowly grooved along the upper side; lateral nerves 7 to 10 pairs, oblique, ascendingly curved toward the more or less united ends 3 to 5 mm. below the edge, reticulations fine and quite evident from beneath; petiole very stout, 1.25 cm. long, grooved along the upper side especially toward the lamina. Inflorescence short paniculate, terminal and well exceeding the foliage or upon leafless twigs, very rigid, less than 1 dm. long, usually with 2 or more main subterete stalks, branched from the middle; branches subterete, dark green, the larger ones occasionally rebranched, opposite, apparently articulate, the ultimate ones very short, all comparatively thick; flowers usually solitary, terminal, showy, odorless, occasionally measuring 5 cm. across but usually smaller, sessile; calyx campanulate, glabrous and green, 7.5 mm. high and as wide between the bases of the sepals; segments 4, unequal, ascending, spoon shaped, the larger pair 1 cm. wide and ovately rotund, the smaller ones scarcely one half as large, margins thin and petaloid, pellucid punctate on the inner surface; petals of a similar number, greenish on the outer or exposed portions, whitish otherwise, subpersistent, rotately spreading or reflexed as the calyx segments, deeply concavo-convex, short ovately abruptly constricted into a short and broad basal claw, densely pellucid punctate from both sides, the 10 veins nervose especially toward the apex, margins much thinner and without nerves or glands, thickest at the base, 1.5 cm. long, 2 to 3 mm. less across the middle;

stamens very numerous, 2.5 cm. long; filaments cremeus, filiform, unequal in length, interlaced; anthers brownish, 1.25 mm. long, oblong, dorsally affixed between the folds, base falsely bilobed; style terete, straight, nearly as long as the stamens, whitish except the greenish apex; ovary crown dull yellow; fruit nearly 2 cm. in diameter, globose, bright shining red, the meat rather juicy and pure white, edible.

Type specimens 11702 and 11327, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August and September, 1909.

The type number is quite common in the dense forested basin of rich moist and humus covered soil in the vicinity of Mainit creek at 4000 feet altitude; this the Bagobos called "Malatado." The other specimen was gathered at 3750 feet of mount Calelan and the native named it "Calugpo."

Only distantly related to *E. vidaliana Elm.*

Eugenia luzonensis Merr.

Field-note:—Erect tree, 25 feet high and with an 8 inch thick stem; bark gray or brown, scaling in thin irregular plates; wood dirty white, moderately hard and heavy, odorless and tasteless; main branches from below the middle, ascending, toward the top numerously rebranched, forming an elongated dense crown, twigs ascending; leaves horizontal or descending, numerous, coriaceous, darker green on the upper shallowly conduplicate surface, tips recurved, somewhat yellowish green beneath; infrutescence scattered along the branchlets, only a few inches in length, all its stalks shining smooth and yellowish green; fruits bluntly ellipsoid, 0.5 inch long, yellowish or ultimately red.

Represented by number 11765, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

Collected in fertile grass lands at 2750 feet. "Labog" is the Bagobo vernacular name.

Eugenia cortico-papyracea Elm. n. sp.

Large tree; trunk 6 dm. thick, 15 m. high at least; wood moderately hard, dirty white or yellowish so on the outside,

odorless and tasteless; old bark light or yellowish cinnamon brown, scaling in several layers of thin papery irregular plates; main branches arising from above the middle, the larger ones ascending, ultimately numerously rebranched; twigs slender, rather crooked, terete, gray, forming bushes. Leaves coriaceous, smooth, the acute to acuminate points strongly recurved, conduplicate on the upper deeper green surface, drying avellaneus on both sides, oppositely scattered but mostly toward the ends of the twigs, margins entire and not involute, oblong or broadly fusiform in shape, base acute to subcuneate, the average blades 1 dm. long by 4 cm. wide aross the middle or widest portion; the prominent midvein shallowly sunken on the upper side; lateral pairs 7 to 9, the faint basal pair submarginal, the balance oblique and their tips archingly united 2 to 3 mm. from the edge, reticulations fine but nearly obscure; petiole at least 5 mm. long, caniculate along the upper side. Inflorescence chiefly along the branchlets below the foliage, 5 cm. long or less, divaricate, usually opposite; peduncle solitary or 3-branched from near the base, regularly rebranched from below the middle, terete, smooth and glabrous, shining green in the fresh state; secondary branches similar, occasionally rebranched; divaricately spreading; flowers usually in 3's, occasionally in pairs, seldom solitary, odorless, sessile from the distal ends of the ultimate branchlets; calyx yellowish green, 1 cm. long and as broad across the top, the basal one third narrowly constricted, otherwise broadly turbinate, more or less glandular spotted, terete; the 4 calyx lobes thick, nearly equal, 4 mm. broad, 2 to 3 mm. high, broadly obtuse or rounded, well separated; petals of an equal number, cremeus, orbicular or obovately oblong, at the base constricted into a very short and broad thick claw, thinner and eglandular at the marginal portion, otherwise glandular; stamens indefinite, creamy white, glabrous, crinkled and interlaced, dark brown when dry, 1 cm. long, unequal in length, apical portion very thin; anther yellowish, ovately oblong, compressed, 0.75 mm. long, attached on the back below the middle; style terete, 1.5 cm. long, minutely glandular, terminated by a dark green stigma, yellowish white toward the base, pale white in the dry state; cup smooth and yellowish.

Type specimen 11571, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Of this flaky species I saw only a few trees in rich moist soil of deep forests along the Mararag creek at 5000 feet on the east side of mount Apo. The Bagobos call it "Labag."

Eugenia toppingii Elm. n. sp.

Strict small tree; stem 8 m. high, 1.5 dm. thick; branches from the middle, divaricate, rather long and freely rebranched; wood moderately hard, dull white or reddish toward the center, odorless and tasteless; bark brown, smoothish; twigs terete, the younger ones brown, the older grayish, tips glabrous. Leaves also glabrous, rigidly coriaceous or subchartaceous, horizontally spreading, flat or only the tips slightly recurved, dark deep green above, much paler beneath, base obtusely rounded, more or less decurrent along the basal 5 to 10 mm., entire, opposite, widely scattered along the branchlets, few, when dry the upper side much darker brown than the lower, oblong or ovately oblong, varying from 1.5 to 3 dm. long, 6 to 10 cm. wide across the middle or a trifle below it; midrib flattish on the upper side and glandular toward the base, conspicuous beneath; lateral pairs 10 to 15, oblique, prominent beneath, their ends archingly united 5 mm. below the edge and a faint submarginal vein, cross bars or reticulations very fine and relatively prominent from beneath; petiole thick, 2 cm. long, deeply channelled above. Inflorescence odorless, terminal or axillary, widely spreading and the longer ones subpendant, from 1 to 3 dm. long and as wide; peduncles usually 3, slender, terete, branched from above the middle; branchlets opposite, few, divaricate, only sparingly rebranched, all relatively long and slender; flowers solitary or occasionally in pairs from the ends of the 1 cm. long articulated pedicels; calyx 1.5 cm. long and as wide including the segments, the basal portion narrowly turbinate, yellowish green; its segments 4, deeply concave andwidely spreading, margins thin and petaloid, otherwise thick, the dorsal side minutely papillose, the inner side with few large glands, the larger pair nearly 1 cm. across, the alternating pair much smaller, all oval or broadly elliptic; petals 4, subpersistent, reflexed, the broad basal portion thickened, at least 1.33 cm. long, ovately elliptic, abruptly constricted toward the claw into auricular lobes, strongly veiny, cremeus, densely glandular punctate except the thin marginal portion; stamens nu-

merous, 2.5 cm. long, whitish; filaments very unequal in length, glabrous, filiform, more or less interlaced above the middle; anthers yellowish brown, obovoidly oblong, less than 1 mm. long, dorsifixed, the more tapering basal portion not lobed; style terete, much thicker than the filaments, persistent, exceeding the stamens, tapering toward the minute greenish stigma.

Type specimen 11181, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Discovered on a steep densely wooded ravine along streamlets on the overland trail along the Sibulan river at 2500 feet altitude. The vernacular Bagobo name is "Lawisan." Named after *Mr. Leroy Topping*.

Eugenia sablanensis ramulosa Elm. n. var.

A 15 m. high tree and with a 7 dm. thick stem; bark smooth, brown, gray on the branches; wood whitish, moderately hard and without odor or taste; main branches crookedly spreading toward the top, ultimately numerously rebranched; twigs erect, yellowish gray or brown, angular, the green young portion glabrous and somewhat flattened. Leaves shining dark green above, much lighter and duller beneath, shallowly conduplicate, rounded at the top except the abruptly recurved and short blunt obtuse point, broadly cuneate at the base, the entire margins recurved in the dry state, opposite, scattering, drying very unequally brown on the 2 sides, 9 cm. long by one half as wide a trifle above the middle, obovate to obovately oblong or subelliptic, rigidly coriaceous; midrib conspicuously ridged beneath, deeply grooved above; lateral nerves very faint, about 20 pairs, divaricate, frequently with secondary pairs forming a very obscure submarginal line, reticulations none; petiole angular, grooved above, less than 1 cm. long. Inflorescence erect, terminal, less than 1 dm. long, subcorymbose, nearly as wide across the top, exceeding the foliage; peduncles 3, usually branched from below the middle, the branches freely rebranched toward the top, all glabrous and somewhat flattened, frequently articulate, subtended by pairs of blunt persistent bracts; flowers sessile, erect, also subtended by similar bracts, usually solitary from the very short and articulated branchlets or pedicel; calyx 4.5 mm. long, 3.5 mm. wide across the top, yellowish green, upon exposure becoming red, more or

less angular, turbinate in anthesis, urceolate and subterete in the fruiting state, crown permanently 4-apiculate; petals greenish yellow or somewhat tinged with pink, 4, forming a calyptrate hood 2 to 3 mm. across, suborbicular, few nerved, eglandular; stamens not very numerous; filaments easily becoming detached, cremeus, usually with a sharp bend from above the middle, 3.5 mm. long but frequently shorter, compressed and considerably wider toward the base, apex pointed; anthers 0.75 mm. long, ovately oblong, dorsifixed, the basal lobes usually contiguous; style of the same color, 3 mm. long, terete, strict.

Type specimen 11633, *A. D. E. Elmer,* Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

Gathered in moist fertile soil of dense woods north of the Baruring river at 4000 feet altitude. This also the Bagobos call "Malagsam."

From *E. incrassata Elm.* it differs mainly in the thinner and differently shaped leaves. From *E. sablanensis Elm.* by the more branching inflorescence which usually exceeds the foliage.

Eugenia gitingensis Elm. n. sp.

A very slender tree; stem 1.5 dm. thick, 10 m. high, terete, crookedly branched toward the top; wood hard, heavy, odorless, a trifle bitter, dull white on the outside, becoming brownish toward the center; bark smooth, brown, reddish so beneath the epidermis; twigs lax, the young portion green, very smooth and slender, terete. Leaves coriaceous or subchartaceous, ascending from the petiole, curvingly folded on the upper very deep green surface, much lighter green beneath, the recurved apex gradually tapering into the acute to acuminate point, nearly castaneus brown when dry, elliptic or ovately oblong, base broadly obtuse and distinctly decurrent for at at least 5 mm., the entire margins very minutely involute, opposite, widely scattering along the branchlets, not numerous, the normal lamina 1 dm. long by 5 cm. wide across the middle or below it, some larger and smaller; midvein very stout beneath, finely grooved above; lateral nerves about 20 pairs, relatively obscure from both sides, divaricate or slightly curved, their tips united into a distinct submarginal line 1.5 mm. from the edge, reticulations fine and evident from beneath only; petiole stout, at least

1 cm. long, rugose on the lower side, broadened and grooved on the upper. Inflorescence lateral or terminal upon special branchlets, quite rigid, green, greatly varying from 5 to 15 cm. long, oppositely branched from below the middle, the ultimate branchlets very short, all thick and terete; flowers clustered or scattered toward the ends of the branchlets, sessile, faintly fragrant; calyx 4 mm. long, one half as wide across the truncate apex, the upper part turbinate, the basal narrowed into a false stalk, greenish yellow; petals 4, forming an imbricately overlaid circular hood 2.5 mm. across, falling easily and as a whole, rotund to orbicular, the inner ones smaller, cremeus; stamens numerous and incurved in the bud state; filaments filiform, 5 mm. long on the outside, the inner or younger ones a trifle shorter, crinkled, interlaced, yellowish white, thicker and subcompressed toward the base; anthers 0.33 mm. long, subrotund or oblongish, dorsifixed, deeper yellow; style strict, 3 mm. long, subterete, relatively small at the apex, fruits purplish, elongated ellipsoid, fully 1.5 cm. long.

Type specimen 12078, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Rare in red humus covered soil at 1500 feet altitude along the densely wooded trail to España.

Separated from *E. decipiens K.* et *V.*, a Javan species, by the relatively much broader leaves, conspicuous lateral nerves and a prominent submarginal vein. The calyx in our specimens are entirely truncate, not bluntly apiculate or dentate.

Eugenia malaccensis Linn.

Field-note:—A medium sized tree; stem 2 feet thick; hard wood covered with smoothish gray bark; branches arising from below the middle, widely spreading; leaves horizontal or descending, thickly coriaceous, shining deep green above, much lighter green beneath, shallowly conduplicate on the upper side; flowers in small scattered clusters along the stem and larger branches; calyx pale green, rigid; petals, stamens and pistils bright red or pink, the small anthers yellowish; fruit darker red, pyriform, nearly 2 inches long.

Represented by number 11964, *Elmer*, Todaya (Mt. Apo), Mindanao, October, 1909.

On an open well drained hill at 1500 feet altitude. Known to the Bagobos as "Tual."

Eugenia mindanaensis C. B. Rob.

Field-note:—A stocky tree with widely spreading branches; branchlets numerous, glabrous, shining brown, terete; leaves subcoriaceous, somewhat folded upon the darker upper side, paler green beneath, apices recurved; fruit 1 inch long, usually sunken at the top, much constricted toward the base, white or the exposed sides reddish tinged, lucid.

Represented by number 11974, *Elmer*, Todaya (Mt. Apo), Mindanao, October, 1909.

In fertile soil of open places or in light woods at 2500 feet. Well known to the Bagobos as "Tabis."

It grows in very similar places as *E. malaccensis Linn.* and is about as rare. Both of these edible species seem to me to have been originally introduced.

Eugenia crassipes C. B. Rob.

Field-note:—Erect shrub; stem 18 feet high, 6 inches thick, branched from below the middle; wood dingy white or brownish, rather soft, odorless and tasteless; bark yellowish brown, smooth; branchlets quite numerous, spreading, rather slender; leaves coriaceous, deep and shining green above, much paler or yellowish green beneath, flat or folded toward the recurved apex, the largest ones a foot long and fully 6 inches wide across the middle or just below this; buds obovoid; young infrutescence terminal or lateral, usually in 3's; the green pedicels 0.33 inch long; calyx yellowish green, gradually tapering from the base to the rim which is 1 inch across; ovary and persistent style dull white, the ovary rim green; fruit ovoidly elongated, 5 cm. long, nearly vinosus.

Represented by number 12147, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, March, 1910.

Collected in gravelly soil along the wooded banks of the Pauala river near the junction of the south fork at 750 feet altitude. "Mabuyabos" is the local Visayan name.

This may be incorrectly determined, at least it seems very near to *E. magalantha C. B. Rob.*

Eugenia magalantha C. B. Rob.

Field-note:—A bushy and suberect shrub; stem crooked, wadded and twisted, branched from near the base, 6 inches thick, 15 feet high or long; main branches long and widely spreading over the river bed, not numerously rebranched; wood sappy white, duller in or toward the center, quite hard and heavy, odorless and tasteless; bark smooth, yellowish gray or wearing off in thin plates which themselves are smooth; the longer twigs usually somewhat drooping; leaves descending, coriaceous, shining deep green above, much paler beneath, the short petioles shining umber brown, usually twisted toward the recurved apex; inflorescence lateral, occasionally terminal, few flowered, pendant; buds obovoid, the exposed portion lividus; petals short, white, caducous; ovary disk melleus, the styles and stamens white or stramineus yellow especially the anthers; flowers slightly odorous, the stamens early falling from the broad whitish disk, hanging, varying from 3 to 5 inches across.

Represented by number 12916, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

In sandy soil packed with river stones along the slightly wooded Iwahig river banks at 250 feet.

Eugenia panduriformis Elm. n. sp.

Small erect tree; stem 3 dm. thick, 12 m. high; its branches mostly above the middle, ascending, sparingly rebranched; wood moderately hard, whitish, odorless, with a faint bitter taste; bark brown, smoothish, grayish on the branches; twigs rather long, suberect, terete, 3.5 cm. thick, obscurely angular. Leaves occasionally interspersed with very small bract-like lamina, mostly toward the ends, ascending, flat or sometimes slightly folded on the upper dark green and lucid surface, arranged in alternating whorls of 3, rigidly chartaceous, much paler green beneath, 5 to 7 dm. long, nearly 2 dm. wide above the middle, subpandurate, rounded at the top, gradually tapering to the 3 to 5 cm. wide

slightly auriculate base, margins entire and recurved in the dry state, curing dull brown on both sides, in general outline obovately oblong, glabrous; midrib very stout and prominent on both sides, yellowish; lateral nerves much less conspicuous, 30 to 40 primary pairs, divaricate, strict, their tips united and forming a distinct submarginal vein 5 mm. below the edge, reticulations coarse and quite obscure; petiole thicker than long. Inflorescence erect, terminal, forming a dense flat 2.5 dm. wide corymb; the main stalks arranged in 3's, the outer ones 1.5 dm. long, oppositely branched above the middle; all the stalks stout, angular, the upper ones subtended by a pair of thick blunt persistent green and reddish margined bracts; flowers sessile, also subtended by similar bracts, odorless; calyx 1.25 cm. long at least, angularly turbinate or subterete, 1 cm. wide across the top; its segments 4, persistent, erect, rigid, the basal portion thick, thinner toward the entire margins, the middle region pellucid punctate especially so on the inner side, the numerous veins obscure, all alike in size, at most 7.5 mm. wide, 4 mm. high, broadly rounded; petals 4, imbricately overlaid and forming a circular concave hood 1 cm. across, rotund or orbicular, glandular punctate except the thin margins, the inner ones thinner and a trifle smaller; stamens numerous; filaments closely contiguous toward the base, inflexed from above the middle, slightly flattened, gradually tapering toward the apex, sprinkled with large glands all along and on all sides, the outer ones 2 cm. long, shorter gradations toward the center, early falling; anthers lanceolately oblong, 1.25 mm. long, dorsifixed from below the middle; style strict, terete, more densely glandular, gradually tapering from base to minute stigmatic portion; calyx rim thick, 5 mm. deep, narrowed toward the base, coarsely glandular or rugulose.

Type specimen 11246, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Only one tree of this magnificent species was discovered on a forested ridge at 3250 feet of mount Burebid. "Lauwagan" is the native Bagobo name.

Eugenia merrillii C. B. Rob.

Field-note:—Slender shrub, 18 feet high, with a 2 inches thick stem; branches widely spreading, arising from below the

middle, sparingly rebranched; wood rather hard, dingy white or brownish, odorless and tasteless; bark brown, smooth or flaking in thin plates; twigs subdrooping, green, angled; leaves also drooping, flat or only their tips recurved, shining, coriaceous, the upper side a trifle darker; the pendulous inflorescence more or less concealed by the terminal pair of leaves, possessing a skunk odor, green except the yellowish ovary and whitish petals; its anthers are paler green than the filaments.

Represented by number 12112, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, March, 1910.

Collected in moist clay along a wooded streamlet at 750 feet altitude near the Pauala river.

Not typical Palawan material and at first it was considered by me as a variety.

Eugenia foxworthyi Elm. n. sp.

Tree, with a terete trunk 10 to 15 m. high, 4 dm. thick; wood moderately brittle and hard, sappy white, brownish interiorily, without odor or taste; bark smooth, yellowish gray; main branches from the middle, ascending, ultimately numerously rebranched, forming a dense flattish crown or top; twigs angular, erect, greenish, the young portion glabrous. Leaves subcoriaceous, oppositely scattering along the branchlets, erect, nearly flat, obovate to obovately oblong, the entire margins minutely involute in the dry state, glabrous, apex short and broadly obtuse, base subcuneate, lucid green on the upper side which turns nearly black while drying, subavellaneus and minutely punctate beneath, the larger lamina 9 cm. long and 4 cm. wide a trifle above the middle, occasionally much smaller and broadly oblanceolate in shape; midrib raised beneath, gland sprinkled toward the base; lateral nerves faint, pinnate, submarginally united, from 15 to 20 or more on a side, reticulations obsolete; petiole 7.5 mm. long, ridged along the lower side, fluted on the upper. Infrutescence subcorymbose, terminal or from the uppermost leaf axils, erect, always glabrous, 1 to 2 dm. long; peduncles usually 3, strict, angularly branched from the middle; branchlets green, rather numerously and oppositely rebranched, articulate, subtended by pairs of short thick bracts and appearing as rugulose, subterete; flowers slightly odorous, solitary

or 3-clustered from the distal ends of the very short ultimate branchlets, sessile, similarly subtended by bracts; calyx subcampanulate, 3.5 mm. long, nearly as wide across the top, pale green; calyx segments 4, very shallow and roundly obtuse, well separated, nearly equal; petals or rather corolla yellowish green, apparently 4 yet so well overlaid as to appear as a single calyptrate hood, with few pellucid glands, 4 mm. across the circular hood when fully spread out; stamens 40 to 50, strongly inflexed in the young state; filaments unequal in length in the early stage of anthesis, pale creamy white, glabrous, incurved toward the apex, the longer ones 3 mm. long, sharply pointed at apex; anther yellow, broadly oblong, 0.75 mm. long, distinctly bilobed at the base, dorsally attached to the sinus; style of the same pale yellow color, strict, terete, 2 mm. long, ending in a small capitate stigma; top of ovary and calyx cup deep yellow.

Type specimen 11280, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered in good well drained soil of a dry wooded ridge at 2750 feet altitude. Known to the natives or Bagobos as "Calignau." I take pleasure in naming it after *Dr. F. W. Foxworthy*, dendrologist and now a member of the Agricultural College faculty of the Philippines University.

Eugenia mainitensis Elm. n. sp.

An erect tree; trunk 12 m. high, 4.5 dm. thick; main branches chiefly above the middle, scattered, crookedly rebranched, the ultimate ones numerous; wood hard, odorless and without taste, brownish especially toward the center; old bark brown, somewhat checked and scaling in irregular plates, smooth on the branchlets; twigs numerous, relatively short, terete, the young green portion glabrous. Leaves copious, opposite, ascending, coriaceous, shining dark green upon the slightly folded upper surface, paler green or even yellowish green beneath, obovate or obovately oblongish, short obtuse or rounded at the apex and terminating into a very blunt point, base cuneate, entire margins subinvolute in the dry state, curing blackish on the upper side and lighter or brown beneath, the expanded portion 5 cm. long by one half as wide above the middle, frequently the uppermost pairs much smaller and oblanceolate; midrib prom-

inently ridged beneath, grooved along the upper side; lateral nerves many, very obscure, pinnate, forming an inconsipcuous submarginal line; petiole 5 to 8 mm. long, ridged along the lower side, caniculate along the upper. Inflorescence erect, terminal, 3 to 10 cm. long; peduncles usually solitary, branched from above the middle, subtended by a reduced pair of leaves, angular, pale or yellowish green; branches opposite and divaricate, compressed, glandular, rebranched from above the middle; the ultimate ones rather numerous, short, articulate, subtended by thickened bract vestiges; flowers solitary from the very short articulate pedicels or sessile, subtended by a pair of extremely small bracts; calyx 3 mm. long, 2.5 mm. across the top, turbinate, yellowish green, glabrous, sprinkled with glands; segments none or minutely 4-apiculate; petals about 4, imbricately folded over and forming a calyptrate hood which is circular and 2 mm. across, cremeus; stamens toward 40; filaments very unequal in the young flowers, the larger ones 1 mm. long, very much thinner at the distal end, otherwise fleshy and somewhat compressed; anthers 0.33 mm. across, subglobose, fully as wide as long, attached on the back below the middle; style short, terete.

Type specimen 11821, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

On a dry densely wooded steep ridge at 4500 feet altitude on the west side of Mainit creek on the trail to Baclayan. This species as well as a number of others the Bagobos call "Malagsam."

At first glance it appears like *E. foxworthyi Elm.* yet upon close examination it is as fine a distinct species as one could wish.

Eugenia incarnata Elm. n. sp.

A rather small middle sized tree; stem 3 dm. thick, terete except the burly or wadded base, more or less crooked, 12 m. high, branched toward the top; wood hard, heavy, burly, odorless, slightly bitter, gradually changing from the outer dull yellowish brown or nearly white sapwood to the brownish black heart; bark dull yellow except the scaling gray or dull brown epidermis; branches forming a flattish dense crown; the ultimate ones numerous, the young green portion suberect, lax, subterete. Leaves opposite, copious, ascending, coriaceous, obovately

elliptic, glabrous, curing nearly latericius beneath, entire, the larger blades at least 6 cm. long by one half as wide across the middle or above it, broadly rounded or truncately so at the apex and with a blunt very short tip in the middle, base obtuse or acute, midrib ridged beneath, grooved above; lateral nerves numerous and fine, oblique, their tips united into a line 2 mm. from the edge, reticulations nearly obsolete and more or less subparallel; petioles stout, 5 mm. long or longer, caniculate on the upper side, very dark brown. Infrutescence erect, terminal; peduncle subterete, usually single, branched from the middle, smooth and shining, pale green; branches divaricate, more angular, quite freely rebranched, the ultimate ones 5 mm. long; fruits in pairs or occasionally 3-clustered, sessile, oblongish globose, 7.5 to 10 mm. long, 5 to 7.5 mm. thick across the middle, smooth, of a pretty waxy or incarnatus red, containing 1 or usually 2 seeds, calyx rim persistent, exocarp thin; seeds finely punctate, irregular on the ventral side, more or less rugose on the dorsal side, toward 7.5 mm. wide across the middle of the larger ones, green in the fresh state.

Type specimen 13231, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered on my last trip along the west branch of the Iwahig river, upon seepage rock ledges covered with thin woods at about 750 feet. The fruits give the trees a red appearance.

Eugenia iwahigensis Elm. n. sp.

A middle sized tree; stem terete, 3 dm. thick, 10 to 12 m. high, branched mainly toward the top and forming a dense flattish crown; bark dark brown below the yellowish gray surface which in the old state usually peels in small plates; wood hard, brittle, quite heavy, odorless, a trifle bitter, the central portion nearly umber brown; twigs erect, numerous, relatively short, terete, the greenish tips also glabrous. Leaves ample, thick and rigid, flat, ascending, paler green beneath, the entire margins curved upon the nether side, opposite, scattered along the branchlets, drying grayish green, obovately elliptic or elliptically oblong, rounded at the apex, obtuse to acute at the base, the average blades 6 cm. long by one half as wide across the middle or a trifle above it, minutely punctate beneath; midrib conspicuous

beneath, little channelled above; lateral nerves 10 to 15 pairs, quite obscure from beneath, their ends forming an obscure submarginal vein, reticulations evident only from beneath; petiole 5 mm. long, blackish brown when dry, grooved along the upper side. Inflorescence slightly fragrant, profuse from the fallen leaf axils or from the lowermost leaf axils; peduncles green, strict, usually clustered, varying from 5 to 20 mm. long, very slender, subterete, glabrous, apparently finely glandular, unbranched or rarely so; flowers few clustered at the distal end, the larger stalks usually with another whorl further down, subtended by bract vestiges; calyx tube 1.25 cm. long, 3 mm. wide across the pink obscurely 5-toothed or crenate apex, slenderly turbinate, the basal one half appearing as a stalk, terete, finely papillose or granular in appearance, yellowish green; petals cremeus, forming a calyptrate hood, caducous, orbicular, 3.5 mm. across, obscurely veiny, sprinkled with pellucid glands, about 5 in number; stamens similarly colored numerous; filaments 6 mm. long, the inner ones shorter and eglandular, subterete, pointed at apex, the outer ones occasionally glandular, relatively straight or only the upper portion intermixed; anthers yellow, 0.75 mm. long, oblong, dorsifixed from between the basal lobes; style terete, nearly 1 cm. long, thick, gradually tapering from base to apex, occasionally gland dotted; calyx cup shining deep yellow.

Type specimen 12742, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Gathered in the dry gravelly flat of secondary forests at 250 feet altitude. Quite rare!

Eugenia arcuatinervia Merr.

Field-note:—Tree, 45 feet high, with a 1.5 foot thick stem, terete; wood rather hard, whitish, odorless and tasteless; bark yellowish brown, smoothish; main branches arising from the middle, ascending, ultimately numerously branched; twigs terete, green, erect, rather short; crown conical, dense; leaves ascending, recurved toward the apex, folded upon the upper much deeper and shining green surface, coriaceous; infrutescence strictly erect, all the stalks dark green as is also the calyx.

Represented by number 11312, *Elmer*, Todaya (Mt. Apo), Mindanao, August, 1909.

Gathered in dense forests north of the Baruring river at 4000 feet altitude. "Malagsam" is the native Bagobo name.

Eugenia oblanceolata C. B. Rob.

Field-note:—A 50 feet high tree, with a 2.5 feet thick trunk; wood moderately hard, pale white on the outside, odorless and tasteless; bark smoothish, yellowish brown, scaling in irregular plates; main branches arising from above the middle, crooked and widely spreading, the ultimate ones rather short and forming more or less dense bushes; twigs rigid, angular, suberect, shining green; leaves ascending or horizontal, recurved, rigidly coriaceous, conduplicate on the upper lucid green surface, much lighter beneath; the inflorescent stalks thick, angular, green and rigid; calyx brown margined, otherwise greenish; petals greenish white or slightly tinged with red, small, calyptrately falling; stamens and pistil yellowish except the greenish stigma; flowers only slightly odorous.

Represented by number 11627, *Elmer*, Todaya (Mt. Apo), Mindanao, September, 1909.

Gathered in dense humid forests at 4000 feet altitude. Known to the Bagobos as "Lauwegan." Very rare in our locality.

Eugenia calvinii Elm. n. sp.

A medium sized tree; stem 6 dm. thick, straight, terete except toward the wadded base, 12 m. high or higher, branched toward the top only; wood quite hard, heavy, brittle, latericius except the thin white sapwood, odorless and without taste; bark castaneus except the smooth yellowish gray epidermis; main branches crooked, spreading, numerously rebranched, terete, glabrous on the green terminal portion, forming dense masses. Leaves rigidly coriaceous, horizontal, recurved especially toward the sharply acuminate apex, deeply and curvingly folded upon the upper side, much paler beneath, drying castaneus above, lighter brown on the nether side, opposite, the entire edges subrecurved in the dry state, base obtuse or broadly cuneate, elliptic to elliptic oblong, the larger blades 12 cm. long by one half as wide across the middle, only a few pairs toward the ends

of the branchlet, the smallest leaves broadly lanceolate; midrib very stout and prominent beneath, deeper brown when dry, deeply grooved upon the upper leaf surface; lateral nerves 9 to 12 pairs, with occasionally secondary ones interspersed, equally visible from both sides, subdivaricate, their tips united into a submarginal vein 3 to 5 mm. from the edge, reticulations numerous and conspicuous; petiole stout, 1 cm. long, furrowed along the upper side. Inflorescence suberect, terminal or subterminal, 5 to 9 cm. long, rigid, branched from above the middle or occasionally from below it; peduncles usually 3, subangular, green glabrous, stout; main branches similar, divaricate, thickened at the base, occasionally short rebranched, the ultimate ones with a thick distal end which bears the few to severally clustered sessile flowers; calyx 7.5 mm. long, nearly as wide across the more or less irregular or undulate top, the upper broadly turbinate portion abruptly constricted into a pseudostalk, yellowish; lobes 4, broadly orbicular or somewhat irregular in shape, 5 mm. across, very sparsely glandular, rotately spreading or reflexed, finally breaking off; petals of the same number, similar in shape, more veiny and glandular dotted in the middle basal region, caducous, stramineus, free; stamens indefinite; filaments white, interlaced, filiform and somewhat flattened toward the base, the outer ones 1 cm. long; anthers sulphureus, 0.75 mm. long, broadly oblong, dorsifixed from between the 2 basal lobes; style terete, similar in color and length as the stamens, nearly straight or curved, cylindric; calyx cup broad and shallow, flavus.

Type specimen 12869, *A. D. E. Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in fertile humid woods or forests at 750 feet altitude along the Napsan trail. Named after *Prof. Otis W. Calvin* of the Manila Normal School.

Leaves more numerously nerved and their finer reticulations much more prominent on both sides than in *E. philippinensis C. B. Rob.* The branching of the inflorescence is also different in ours.

Eugenia viridifolia Elm. n. sp.

A middle sized erect tree; stem 6 dm. thick, 15 m. high subterete or wadded toward the base, its main branches

from the middle and ascending, crooked, ultimately numerously rebranched and forming a dense crown; wood avellaneus for the greater central mass, gradually changing to the thin whitish sapwood, hard, heavy, odorless and also without taste; bark avellaneus gray except the castaneus inner surface, scaling in thin irregular plates; twigs lax, numerous, subterete, conspicuously grayish white, the young tips more compressed. Leaves dense, mostly horizontal, slightly recurved toward the acute to acuminate apex, conduplicate, on the lower side only a trifle paler green, glabrous, drying subviridis, oblong, less than 9 cm. long and 3.5 cm. wide at the middle, base obtuse, margins entire, opposite, pretty well crowded toward the ends of the numerous branchlets; midrib prominent beneath, sunken above; lateral nerves 10 to 15 pairs, with occasional secondary ones, very obscure, subdivaricate, their tips forming a submarginal line 1.5 mm. from the edge, the reticulations quite evident; petiole 5 mm. long, subterete, channelled along the upper side. Inflorescence umbellately clustered in the leaf axils, upon short very sparingly branched common stalks less than 5 mm. long and subtended at the base by bracts; flowers strict, spreading, subtended by bracteoles or mere vestiges, 10 to 12.5 mm. long, nearly 5 mm. across the top, slenderly and gradually tapering from base to apex, glaucus or yellowish green, more or less covered with dark brown minute glands, terete; its 4 lobes very shallow and rounded, persistent, purple red; petals apparently 6, imbricately folded and forming a circular hood, caducous, orbicular, 3 mm. across, sparingly pellucid punctate, white; stamens not very numerous, incurved in the bud state, nearly straight when in full anthesis; pure white filaments of the same thickness throughout, subterete, the outer few 5 mm. long, most of the inner ones much shorter; anthers ochroleucus, 0.5 mm. long, suborbicular, dorsifixed, emarginate at apex, obscurely bilobed at base; style strict, terete, only slightly tapering toward apex, usually gland dotted, whitish; calyx cup deep, melleus or luteus; ripe fruits shining vermillion red, obconic.

Type specimen 12975, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in well drained soil of the slightly wooded and densely bamboo covered ridge at 2000 feet altitude, or from 750 to 1000 feet above "Baguio" the lookout house.

In my opinion it is not *E. claviflora Roxb.* (*E. leptantha Wight*) because of more numerous leaves which are not long acuminate, flowers only one half as long and with differently shaped fruits.

Eugenia acuminatissima (Blm.) Kurz.

Field-note:—Small tree; stem 8 m. high and 2.25 dm. thick; wood whitish, moderately hard, heavy, without odor or taste; bark brown, thickly checked; branches suberect, rather numerous at the top, the slender twigs green; inflorescence lax, erect, odorless, green except the creamy white flowers.

Represented by number 11904, *Elmer*, Todaya (Mt. Apo), Mindanao, October, 1909.

Collected in moist fertile soil of densely wooded slopes at 3000 feet altitude, near streamlets on the Talon side of the mountain range.

Possibly this should be referred under *E. saligna (Miq.) C. B. Rob.*

Eugenia brevistylis C. B. Rob.

Field-note:—A medium sized rather burly appearing tree; trunk 4.5 dm. thick, subterete, 12 m. high, with its main branches arising from below the middle; wood hard, odorless and tasteless, reddish brown especially toward the center; bark yellowish gray and smooth or scaling in irregular plates; branchlets numerous, suberect; leaves descending, subchartaceous, folded upon the upper very much deeper green surface, apex recurved; inflorescence erect or suberect, pale or whitish green, petals and stamens creamy white, ovary yellow, calyx margins deep red; flowers deciduous, odorless.

Represented by number 12548, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May, 1910.

Collected in moist gravelly soil of wooded banks of the Pauala river at 500 feet altitude. The Visayan of northern Sibuyan call it "Magtungou."

This was provisionally distributed last year under a new name. It is a good match of *Dr. Robinson's* recently published species.

Eugenia cumingiana Vid.

Field-note:—Slender tree; stem 7 inches thick, subterete, 25 feet high, only with few main branches toward the top; wood heavy, burly, dark brown except the thin whitish sapwood, without odor or taste; bark smoothish, yellowish gray; main branches numerously rebranched, the ultimate ones erect and relatively short, forming dense masses; leaves subcoriaceous, ascending, tips strongly recurved, nearly flat, paler green beneath; inflorescence creamy white, entirely odorless, erect, lax, ovary yellowish, the main stalks greenish.

Represented by number 12353, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Gathered in red sticky soil from the forested ridge at 2000 feet altitude along the trail toward España.

It is nearer to 925 *Cuming*, a cotype of *E. cumingiana Vid.*, than to my number 11904 from the mount Apo collection and which I interpret as *E. acuminatissima (Blm.) Kurz.* Certainly these two numbers of my own collection are not one and the same species and I prefer to keep them under different names. If the limits of these two numbers can be stretched to include only one species, then *E. perpallida Merr.* must also be included.

Eugenia perpallida Merr.

Field-note:—Erect small tree; stem 1 foot thick, 30 feet high, with main branches arising from below the middle, ultimately laxly and numerously rebranched and forming a flattish crown; wood rather hard and deavy, dingy white, odorless and tasteless; bark grayish white, scaling on the stem, smooth on the branches; leaves coriaceous, horizontal or descending, folded and recurved especially toward the apex, shining green above, glaucus beneath; the erect terminal inflorescence yellowish green except the yellow ovary and anthers; filaments and petals whitish; style also yellowish, bearing a greenish stigma.

Represented by number 12181, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

Collected in compact soil of light woods bordering open grassy glens at 500 feet altitude or less. "Batungoy" is the local Visayan name.

Eugenia sinubanensis Elm. n. sp.

Slender erect tree; stem 2 dm. thick, 8 to 10 m. high, its main ascending branches arising from the middle, ultimately numerously rebranched; wood hard, odorless, slightly bitter, testaceus except the thin yellowish white sapwood; bark yellowish gray, checked and peeling in plates; twigs short, ascending, fastigiate, glabrous, terete. Leaves opposite, ascending, coriaceous, nearly flat, a trifle paler beneath, gradually acute to acuminate, base cuneate, elliptic to obovately oblong; margins entire and in the dry state rolled upon the upper side, the larger ones 7 cm. long by 3 cm. wide at the middle, drying very unequally dark brown on the 2 sides; midrib still darker brown, gland punctate on the side toward the base; lateral nerves very fine and numerous, near the edge forming a faint line, reticulations numerous and evident from beneath; petiole thick, glabrous, nearly black, 3 mm. long. Inflorescence profuse, also erect, green except the creamy white corolla and stamens, terminal or lateral, 5 cm. long, sparsely paniculately branched from below the middle; peduncles usually clustered, green and angular; the secondary branches opposite or in subwhorls, very sparingly rebranched, similar to the peduncles, bearing few clustered flowers at the distal end; calyx 3.5 mm. long, as wide across the top, rounded, broadly turbinate to subcampanulate, more or less punctate, the 4 undulate teeth purplish red, sessile or short stipitate; petals 4, forming a calyptrate hood, 3.5 mm. long, whitish, orbicular, veiny and sparsely punctate in the middle region, margins subhyaline; stamens numerous; filaments 6 mm. long but frequently shorter, filiform, cremeus, subcompressed, interlaced, tips sharply pointed; anthers yellow, less than 0.5 mm. long, orbicular with notched ends especially the lower or basal one, versatile; style terete, strict, dull yellow, equalling the stamens, only slightly thinner toward the apex; the smooth broad calyx cavity deep yellow.

Type specimens 12805 and 12325, *A. D. E. Elmer*, the former from Puerto Princesa (Mt. Pulgar), Palawan, March, 1911; the latter from Magallanes (Mt. Giting-giting), Sibuyan, April, 1910.

The Palawan specimens were collected on a gravelly wooded bank of the Iwahig river at 500 feet altitude. The Sibuyan material along the Sinuban creek at 1000 feet.

Closely allied to *E. parva (Merr.) C. B. Rob.* based upon *Dr. Whitford's* mount Mariveles collection number 1136. Inflorescence in ours only sparsely branched, the branchlets divaricately spreading, bearing flowers twice as large. Our leaves average again as wide as those on the type specimen.

Eugenia antoniana Elm. n. sp.

A middle sized tree; trunk 4.5 dm. thick, 12 m. high or higher; bark smoothish, yellowish brown, grayish mottled on the branches; wood moderately hard, sappy white, without odor or taste; branches chiefly toward the top, ultimately numerously rebranched and forming quite dense bushes; twigs ascending, umber scurfy, terete, rather slender. Leaves horizontal, the sharply acute to acuminate apex strongly recurved, folded upon the upper deep green and shining glabrous side, much lighter green and brown scaberulous beneath, the 2 sides drying very unequally brown, opposite, not numerous but usually toward the ends of the branchlets, the entire margins subinvolute in the dry state, elliptic to oblongish, chartaceous, obtuse to obtusely rounded at the base, the average ones 1 dm. long by 4.5 cm. across the middle; midrib finely grooved above, very prominent beneath and brown scurfy; lateral nerves with 7 to 12 primary pairs, similarly conspicuous and but slightly less scurfy, divaricate, united into a very prominent vein 5 or more mm. from the edge and the intervening space again nerved and submarginally veined, reticulations coarse and bold beneath, all more or less provided with brown scurfy trichomes; petiole 5 mm. long, caniculate above, densely scurfy brown. Inflorescence erect, terminal, corymbosely paniculate, 5 to 10 cm. long, nearly as wide; the main stalks rebranched from above the middle, subterete, densely umber brown scurfy; the ultimate branches short, articulate, subtended by a pair of subreflexed bracts; flowers few clustered at the ultimate ends of the branchlets, subtended by similar bracts, faint but sweetly fragrant; calyx scurfy or roughly pulverulent, fuligineus, 4 mm. long, nearly as wide across the top, pyriform in the bud state, turbinate when in anthesis, its rim entirely without segmentation, terete, greenish toward the base, otherwise whitish; petals probably no more than 4, all more or less united into a circular calyptrate

hood, 3 mm. across, light cremeus, caducous, glabrate on the outer side; stamens indifinite, also creamy yellow, the outer or longer ones 7.5 mm., the inner ones much shorter, glabrous, filiform, nearly straight; anthers less than 0.5 mm. long, orbicular, dorsifixed between the sinus, the 2 cells well separating in anthesis and basal portion usually bilobed; style columnar, 2.5 mm. long, greenish especially toward the stigma; ovary cup thick and yellowish green.

Type specimen 11621, *A. D. E. Elmer,* Todaya (Mt. Apo), District of Davao, Mindanao, September, 1909.

This very distinct species is at once distinguished from all other Philippine species by the brown scurfy character.

Discovered in very humid forests of moist rich soil at 3750 feet altitude. Only once seen and called "Malagsam" by the Bagobos. Named after our son *Anton Dambor Elmer.*

Eugenia atropunctata C. B. Rob.

Field-note for 12793:—Medium sized tree; stem 2 feet thick, 40 or more feet high, wadded toward the base, otherwise terete and straight, branched toward the top only; wood odorless as well as tasteless, the sapwood white, gradually changing to the latericius heart, quite hard and brittle; bark avellaneus, smooth, nearly badius brown beneath the epidermis; branches widely spreading, numerously rebranched; the twigs relatively short, crooked, suberect; leaves ascending or horizontal, coriaceous, tips recurved, curvingly folded upon the upper darker green side; inflorescence fragrant, profuse along the branchlets, all the stalks dull green, the calyx yellowish or more properly luteus, the stamens cremeus, the ovary disk similar in color, petals pink to white.

Represented by numbers 12793 and 12850, *Elmer,* Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Collected in wooded or forested flats at about 250 feet altitude. Quite common and mixed with *Dipterocarpus.*

Eugenia ixoroides Elm. n. sp.

A middle sized tree; stem 4 dm. thick, 12 m. high, terete, nearly straight, strongly buttressed at the base; wood hard

and heavy, odorless and tasteless, the outer one third dingy white, the central mass brownish; bark dull brown beneath, the grayish white epidermis smooth; branches chiefly at the top, forming a dense congested crown; twigs numerous, horizontal or descending, the glabrous tips ascendingly curved, lax, terete, slender. Leaves coriaceous, similarly spreading, only the short obtuse tips recurved, otherwise flat, much paler or even yellowish green beneath, glabrous, drying nearly castaneus on the upper side, latericius beneath, obovately oblong or merely oblong, the normal ones 1 dm. long by 4 cm. wide, the smallest leaves oblanceolate, margins entire, base subcuneate, oppositely scattering, not numerous; midvein pronounced beneath, blackish brown, glabrate, minutely caniculate above; lateral nerves evident from below, 7 to 9 on a side, their ends forming a line 3 mm. below the edge, ascending, subparallel, reticulations none; petiole stout, 3 mm. long, somewhat expanded across the top and grooved. Infrutescence suberect, terminal, green, usually with 3 or more peduncles although the central one is always the stoutest and longest, paniculately branched from near the middle, 1 to 2 dm. long and nearly as broad; peduncles and branches subterete, glabrate when old, drying brown, the ultimate branchlets divaricate, all more or less articulate and subtended by bract vestiges; pedicels 5 to 10 mm. long, usually bearing few fruits at the distal end; fruit sessile, few-clustered, subtended by bract vestiges, subglobose, 7.5 mm. in diameter when fresh, bright red, smooth, apex flattened and circular, the rim with 4-apiculate teeth; style less than 1 mm. long, persistent, terete, tapering somewhat from base to apex; seeds 2, brown and finely papillate, plano-convex, the ventral side irregular, the dorsal more or less rugose.

Type specimen 13165, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered this tree in fertile soil of humid forests at 750 feet altitude along the trail to Napsan, a small settlement on the west coast. Only one tree was seen and the dry specimens have a strong resemblance to certain species of *Ixora*.

Eugenia mindoroensis C. B. Rob.

Field-note for 13050:—A middle sized tree or smaller in

rank; trunk subterete, 1.5 foot thick, somewhat leaning over the river bed, its main branches from the middle, 35 feet high; wood hard, heavy, burly, the thin sapwood dingy yellowish white, otherwise latericius in color; bark of the same reddish brown except the smoothish yellowish gray epidermis which sometimes peels in thin and rather smooth plates; main branches spreading, profusely rebranched; the twigs slender and lax, horizontal or pendant; leaves similarly arranged, nearly flat, tips recurved, much deeper and duller green on the upper surface; infrutescence green; the ripe fruits nearly globose and only slightly oblique, always less than 0.5 inch in diameter, vinosus when ripe; inflorescence suberect, terminal, its stalks green; the calyx very pale green; style and anthers nearly of the same color, the filaments are pure white; the flowers are faintly fragrant.

Represented by numbers 13050 and 12775, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March and April, 1911.

Mostly upon wooded river banks of shallow red clay underlaid with a stony débris. Rather common, with cherry-like fruits.

Eugenia ecostulata Elm. n. sp.

Quite a small tree; stem subterete, 1.5 dm. thick, 7 m. high, straight; its main branches ascending from the middle, ultimately numerously rebranched, crooked, the twigs comparatively short and suberect, glabrous and terete at all stages; wood moderately soft or hard, gradually changing from the peripheral whitish portion to the badius center; bark deep reddish brown except the smooth yellowish gray epidermis. Leaves opposite, scattered, coriaceous, horizontal, glabrous, conduplicate, the abrupt acute to acuminate blunt apex recurved, somewhat paler green beneath, curing equally brown on both sides, the entire margins rather sharp, obtuse or acute at base, elliptically oblong, the average blades 1 dm. long by 3.5 cm. wide at the middle, finely punctate beneath; midvein ridged beneath, sunken above; lateral nerves barely visible from both sides, indefinite, more or less united at their tips into a faint submarginal line, reticulations similarly evident; petiole always glabrous, brownish black when dry, not exceeding 1 cm., caniculate above. Infrutescence terminal from the second year old twigs, 1 to 3 cm.

long, 1 to 3-clustered, the stalks short and obscurely angular; pedicel about as long or longer, terete, usually thickened toward the distal end; fruit dark green, globose, 1.25 cm. in diameter, drying shining brown, the exocarp thick, without lateral or oblique lines; seeds 2, unequal, when together 1 cm. in diameter, plano-convex.

Type specimen 13102, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Of this species only one tree was discovered in moist stony soil of densely wooded flats at 250 feet, between the two main forks of the Iwahig river.

Eugenia melastomoides Elm. n. sp.

A slender erect tree; stem 2.25 dm. thick, 8 m. high; branches spreading, forming a lax elongated crown; bark brown, peeling in thin plates; wood heavy, hard, the thin sapwood yellowish white, gradually changing to dark red in the center, odorless and without taste; twigs numerous, brown, slender, terete, the young portion glabrous. Leaves oppositely scattered along the branchlets, flat, horizontally spreading, only the abruptly constricted obtuse or bluntly acute tips recurved, base strictly cuneate, margins entire, quite rigid, dark green above, the 2 sides curing unequally brown, obovate or obovately oblong, the larger blades 9 cm. long by 4 cm. wide above the middle; midvein quite conspicuous on both sides, when young finely pulverulent beneath, soon becoming glabrous; lateral nerves quite evident and equally visible from both sides, the basal 2 pairs much ascending, the upper 3 to 4 pairs only oblique, reticulations faint; petiole less than 5 mm. long, sparsely strigose or cinereous at first, finally glabrous. Inflorescence in subumbellate clusters of few flowers only, green, odorless; pedicel 5 mm. long, slender and strict, sparsely cinereous, ultimately glabrate, arising from short more or less bracteate tubercles; calyx campanulate, 4 mm. long, as wide across the apex without the segments, cinereous, subtended by a pair of short thick bracts; segments 4, rotately spreading, persistent, frequently a pair much smaller, the large pair 4 mm. long, nearly 3 mm. wide across the base, ovately or triangularly oblong, quite thick, veins evident, glands few and scattered, greenish, glabrate except the finely ciliate margins; petals 4,

caducous, 8 mm. long, 4.5 mm. wide above the middle, obovate, narrowed toward the base into a broad claw, veiny, only sparsely dotted with punctate glands; stamens not seen; style 6 mm. or longer, terete, thickest at the base; ovary disk flattish, grayish hairy; fruits many, solitary or in pairs from the leaf axils or in the axils of the fallen leaves along the twigs, obliquely globose, 1.5 to 2 cm. in diameter, with 4 persistent calyx lobes, yellow and edible when mature, the single seed peppery flavored.

Type specimens 10750 for flower and 11013 for fruit, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May and June respectively, 1909.

The flowering material was gathered in humid forests at 3500 feet altitude and was called by the Bagobos "Baring-oras;" the fruiting specimens were gathered in dry woods at 2500 feet and was called "Magdang" by the same natives.

If *E. aherniana C. B. Rob.*, *E. loheri C. B. Rob.* and *E. pasacaensis C. B. Rob.* are recognizably distinct, ours presents a fourth critical species. It is most closely related to the first one mentioned and differs from it in the shape, texture and venation of the leaves; also our fruits are smaller and floral parts larger.

Eugenia lambii Elm. n. sp.

Small or middle sized trees; stem straight, terete, 3 dm. thick, 12 m. high, its main branches arising from above the middle; wood very hard, burly, only the sapwood whitish, otherwise latericius or even blackish in the very center, without odor or taste; epidermis occasionally scaling in plates; the main branches ultimately numerously rebranched, the glabrous twigs very slender and terete. Leaves horizontally spreading, deep dull green above, much lighter green beneath, shallowly conduplicate, the recurved tips rather abruptly acuminate, base obtuse or subcuneate, entire, opposite and well scattering, curing dull brown, the large blades 8 cm. long by 3 cm. wide across the middle, oblong, the smallest ones lance shaped, thinly coriaceous; midrib prominent beneath; the lateral pairs from 10 to 15, oblique, very fine, their tips forming a submarginal line 1 to 2 mm. from the edge, reticulations none; petiole less than 1 cm. long, also glabrous, grooved along the upper side. Old inflorescence lateral and from the lowermost leaf axils, averaging 3 cm. long, divaricate,

few branched toward the top only; peduncle usually solitary but occasionally more, strict, slender, subterete; branches at right angle, short, the longer ones obscurely rebranched at the ends, subtended by minute bracteoles; flowers 1 or 3-clustered at the distal ends of the short ultimate branchlets, when 3 the middle one erect and the lateral ones divaricate; calyx campanulate in the flowering state, urceolate in the fruit, 3 mm. long to base of lobes, 2.5 mm. wide at the top without the segments, smooth; calyx rim atropurpureus, the 4 persistent segments rotately spreading; the obtusely rounded teeth about 1 mm. long, fully as wide across the base, thick, rigid, with only a few glands; style 1.5 mm. long, strict, terete, arising from the middle of the shallow glabrous calyx cup; fruits 4 mm. in diameter, nearly globose, bearing the more or less quadrangular calyx rim.

Type specimen 13047, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Collected in rich moist soil of a dense dipterocarp forest flat at 250 feet altitude. Named after *Mr. C. H. Lamb* who at one time had charge of the Iwahig Penal Colony.

Approaching *E. similis Merr.* but our leaves are less than one half as large; inflorescence slenderer and fewer flowered.

Eugenia lumboy Elm. n. sp.

A shrub-like tree; stem nearly 1.5 dm. thick, 5 m. high, with main branches arising from below the middle; wood moderately hard and heavy, the thin sapwood whitish, otherwise dull brown especially toward the center, burly, odorless and tasteless; bark grayish white, smooth or when old checked in plates; branchlets numerous, ascending, lax, the apical portions dull green, terete, the young portion turning black while drying. Leaves opposite, chiefly along the twigs, thickly coriaceous, ascending, folded upon the upper much deeper green surface, in the dry state blackish brown above, sublatericius beneath and more or less punctate, entire, fusiformly lance shaped, apex acute to acuminate and bluntly rounded at the tip, base acute to subcuneate, 7.5 cm. long by 2.5 cm. wide at the middle, frequently smaller; midvein conspicuous beneath, grooved along the upper side; lateral nerves 10 or more on each side, oblique, very obscure, their ends faintly united into a submarginal line,

reticulations none; petiole thick, 5 mm. long, crinkled on the lower side, channelled above. Inflorescence erect, 5 cm. long or less, glabrous and smooth as is also the foliage; peduncle solitary, branched from below the middle, stout, subangular; branches few, opposite, ascending, short, seldom rebranched toward their distal ends, otherwise similar to the main stalk; flowers solitary or 2 to 3-clustered or even more numerous at the usually thickened ends; calyx 1.25 cm. long, greenish, the basal one half constricted into a pseudostalk, the upper portion broadly turbinate or campanulate, nearly as wide across the top, the rim portion thick; segments 4, about 2 mm. wide, roundly truncate, dotted, margins quite thin, the 2 larger ones 5 mm. broad and alternating with a smaller pair only one half as broad; petals yellowish green, early falling, 4, deflexed in anthesis, 5 mm. long, oval or broadly obovate, very unequal, glandular black punctate except the thinner marginal portion; stamens numerous, the outer or longer ones 1.5 cm. long, the inner ones somewhat shorter; filaments glabrous, filiform, curved toward the apex only, rich purple; anthers 1 mm. long, oblong, truncately rounded at the apex, a trifle narrowed at the bilobed base, basifixed in the sinus, connective reddish, ventrally dehiscing; style also purple, glabrous, terete, equalling the longer stamens, stigmatic portion minute.

Type specimen 12549, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Collected in hot dry sand gravelly soil of the Pauala river flat at 750 feet altitude. The Visayan on northern Sibuyan call it "Lumboy" although this name is also applied to a few other species with similar edible fruits.

This species is nearest to but not identical with *E. merrittiana C. B. Rob.* Our leaves are only one half as large, more glandular punctate and with much less conspicuous lateral nerves than in *Robinson's* type.

Eugenia purpuriflora Elm. n. sp.

A small erect tree; stem 1.5 dm. thick, 8 m. high, terete, somewhat crooked, branched from the middle toward the top; branches few, ascending, rebranched toward their ends, rather short, the few twigs rigid and crookedly rebranched; wood hard, heavy, the thin outer portion whitish, then latericius and even

blackish brown toward the center, without odor or taste; bark smoothish or minutely checked, yellowish gray or brownish. Leaves rigidly coriaceous, horizontal, nearly flat, glabrous, lucid above, paler green beneath, drying dull or reddish brown on both sides, few and opposite, the entire margins subinvolute in the dry state, blackish punctate on the nether side only, 16 cm. long by one half as wide or longer and relatively narrower, frequently much smaller, ovately elliptic to subrotund, apex very bluntly obtuse, base rounded or slightly cordate; midrib stoutly raised beneath, smooth and reddish brown; lateral nerves on the larger leaves about 15 pairs, with secondary intervening ones, subdivaricate, relatively obscure and equally visible from both sides, cross bars few, thin tips united into a submarginal line 5 mm. beneath the edge; petiole 3 to 5 mm. long, about as thick, nearly black when dry. Inflorescence erect, rigid, the green and glabrous stalks terete, 5 cm. long, short and rigidly paniculate or only a few branched toward the top and usually upon 3 peduncles; flowers erect, odorless, few; calyx at least 1.5 cm. long to the base of the segments, green and brownish spotted, occasionally bracteate on the sides, terete, the upper one half broadly turbinate, the balance stipitate, 1 cm. wide at the top excluding the calyx lobes; sepals 4, purplish fringed, in 2 very unequal pairs, well separated, rotately spreading, ultimately reflexed, the larger ones nearly 1 cm. wide and 6 mm. high, rounded, quite rigid, glandular dotted except the yellowish green and thinner marginal portion; petals also 4, pinkish white or purplish, orbicular, at least 7.5 mm. across, severally veined, the large black glands scattered except in the thinner marginal region; stamens very numerous; filaments unequal, subterete, only slightly wider toward the base, erect, strict, red or purple, tips pointed, the longer 2 cm. in length; anthers dull yellow except the red connective, 1.25 mm. long, obovoidly oblong, lobed at the base, affixed dorsally in the sinus; style 1.5 cm. long, terete, deep red; calyx cup shining purple; fruits 2.5 to 3 cm. long, 2 to 3 cm. thick below the middle, smooth, hard, greenish, ovoidly oblong, tapering to the calyx rim, style persistent; seeds 2, nearly equal, plano-concave, at least 1.5 cm. across.

Type specimens 13233 for flower and 13117 for fruit, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May and April respectively, 1911.

In woods from 250 to 750 feet altitude, in shallow dry soil covering the stony subsoil. Not common.

Its alliance is with *E. merrittiana C. B. Rob.* yet quite distinct in leaf characters alone.

Eugenia angularis Elm. n. sp.

A medium sized tree; trunk not strict nor straight, 6 dm. thick, toward 15 m. high, buttressed at the base; wood hard, heavy, odorless, bitter, the thin outer portion sappy white, gradually changing to the dark brown central portion; bark smooth, grayish; main branches from above the middle, crookedly rebranched; twigs numerous, suberect, relatively short and forming dense bushes, terete, glabrous, brown, rigid. Leaves ascending, quite numerously crowded upon the branchlets, rigid, drying very dark brown or nearly black on the upper glazed side, much paler green beneath, shallowly folded, tips rather abrupt, acute to acuminate, recurved and usually twisted, base broadly cuneate, at the base distinctly decurrent for 5 mm., entire margins faintly involute in the dry state, elliptic or more obovately elliptic, oppositely scattered, 9 cm. long without the stalk, 4 cm. wide across the middle; midvein prominent beneath, finely grooved on the upper side; lateral nerves numerous, divaricate, pinnate, very faint, forming an obscure line just beneath the edge, reticulations nearly as evident; petiole black, wrinkled, slightly grooved above, only 1 cm. long without the decurrent basal portion of the lamina. Infrutescence erect, the smooth green stalks more or less angular, 5 to 8 cm. long, 3-branched from the base, oppositely rebranched, the ultimate ones very short, apparently all the branchlets articulate and subtended by very short bracts or bract vestiges; fruits solitary or in pairs from the distal end of the ultimate branchlets, sessile, similarly provided with bracteoles; calyx 1.25 cm. long, smooth, rigid, pale green, strongly quadrangular, gradually tapering from base to the 7.5 mm. wide apex, blackish when dry, the 4 ridges extending into the 4 teeth; segments very rigid and divergent into a wing-like appendage, 4 mm. long, compressed, elongated, the sides united, the basal ventral portion rather broadly expanded and convex or partially hollowed, persistent; petals and stamens not seen; style persistent, 1.5 cm. long, terete, usually curved toward the

greenish apex, stigma minute; rim thick, dull yellow and lucid on the inner side.

Type specimen 12080, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered in deep red soil of dense woods on the trail to España at 1500 feet altitude. Nowhere else seen.

Apparently in the same group with *E. incrassata Elm.*

Eugenia purpuricarpa Elm. n. sp.

A rather large tree; stem 1 m. thick, 20 m. high, terete, chiefly branched toward the top; wood hard, brittle, heavy, odorless and tasteless, changing from the thin sappy white outer portion to the atropurpureus heartwood; bark scaling in thin brown scales; main branches widely spreading and crookedly rebranched; the ultimate ones usually in subwhorls, very numerous, terete, lax, green, glabrous, erect. Leaves ascending, shallowly folded upon the upper darker green side, glabrous. subchartaceous, abruptly terminated by a blunt acute to subacuminate point, base obtuse to broadly cuneate, the entire margins subinvolute in the dry state, the larger blades 7 cm. long and one half as wide across the middle, often much smaller, drying brown on both sides, mostly opposite, well scattered along the branchlets, elliptic or the smaller ones oblong; midvein brown and ridged beneath; lateral nerves numerous, their tips submarginally united into a line, strict, nearly divaricate, a trifle plainer on the upper surface in the dry state at least, the cross bars or reticulations quite evident from both sides, finely punctate; petiole thick, furrowed along the upper side, brown, glabrous, 7.5 mm. long. Young, infrutescence terminal or from the uppermost leaf axils, erect or ascending, widely spreading, less than 1 dm. long; peduncle pale green, branched toward the ends only or occasionally from the middle, all the stalks strict, the few secondary branches in subwhorls and subterete; flowers verticellately clustered at the ends of the ultimate branchlets. chiefly erect; calyx slenderly turbinate, 1 cm. long, terete, gradually tapering in the fruiting state, when in flower campanulate toward the 4-apiculate crown, otherwise appearing stipitate, glaucus green or on the exposed side purple, more or less sprinkled with red in the middle region or above the middle; petals prob-

ably 4, falling as a calyptrate hood, caducous, creamy white and tinged with red, irregularly orbicular, 1.25 mm. across; stamens many, upon the edge of the 1.5 mm. deep calyx rim; outer filaments 2 mm. long, rather thick and subcompressed, crooked or usually incurved, the inner ones very much shorter, whitish, when dry latericius; anther 0.33 mm. long, orbicular, shallowly lobed at the base, dorsifixed, pale yellow; style 2 to 3 mm. long, erect, smallest at the stigmatic portion, much thickened at or toward the base, glandular.

Type specimen 12818, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Discovered in well drained soil of a forested ridge at 1000 feet altitude. Quite rare!

Differs from *E. rosenbluthii C. B. Rob.* by its more numerously and prominently nerved leaves which are finely but distinctly punctate. Inflorescence more scattering, its ultimate branchlets longer, all its stalks subterete not conspicuously angled or winged, neither are the flowers subtended by apiculate bracts.

Eugenia burebidensis Elm. n. sp.

A medium sized tree; stem 13 to 15 m. high, 4.5 dm. thick, subterete; bark smooth, gray on the branches, crookedly spreading and forming a flattish crown, the main branches ascending and arising from near the middle; the twigs numerous, forming dense masses, suberect, comparatively short, the green and glabrous ultimate ones in subwhorls, angular but not winged, the older twigs becoming terete; wood reddish brown, hard, heavy. Leaves punctate on both sides, copious, opposite, ascending, the blunt and abruptly constricted acute to subcuneate apex recurved, somewhat folded upon the darker green upper surface, base acute to obtuse, elliptic, greatly varying in size, the average ones 4.5 cm. long, 2.25 cm. wide at the middle, thick and rigid, brown or sordid when dry, margins entire, when fresh similarly green on both sides; midrib rigid, grooved on the upper side and toward the base; lateral nerves very faint or obscure, 5 to 7 pairs or more, divaricate or oblique; petiole 3 mm. long, also glabrous. Infrutescence erect, terminal, 3 cm. long, very sparingly branched above the middle; peduncles green, glabrous, angular, usually 3, subtended by leaves; the few branches short

and similar to the peduncles, articulate and subtended by bract vestiges; flowers erect, solitary or few clustered, subtended by minute sharply pointed bracteoles; calyx nearly 7.5 mm. long, terete, gradually increasing in thickness from base to apex, the exposed portion in the mature state purplish red, 2 to 3 mm. thick, the old ones fully rounded clear to the base; teeth persistent, erect, rim very short, dull straw colored when mature and in the dry state, 5, blunt, varying from 0.5 to 1 mm. long; petals cream colored, apparently also 5, falsely united into a nearly flat calyptrate disk 1.5 mm. across, very easily falling; stamens about 35, in the young state very unequal in length and incurved, flattened and expanded toward the base, the inner or younger ones very short, glabrous, cremeus, reddish brown when dry, abruptly pointed at apex; anthers more yellow, orbicular and with the 2 cells well separated especially so toward the base, 0.25 mm. across, dorsifixed; style at least 1 mm. long, terete, thick at the base, gradually tapering to the pointed apex; ovary crown crustaceous; ovules in 2 rows, 6 or more in a row; fruit cylindric, deep red to purplish black, truncate at apex, pointed at base, 5 to 8 mm. long, 2.5 mm. thick.

Type specimen 11259, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Collected on a wind swept humid ridge at 3500 feet of mount Burebid. Not otherwise seen. The Bagobos call it "Malagsam."

This species has leaves one half as large as those on *E. rosenbluthii C. B. Rob.* and nerves less distinct on account of the thicker blades; the infrutescence is shorter, sparser and more congested. With *E. purpuricarpa Elm.* they begin to form a critical bunch.

Eugenia mimica Merr.

Field-note for 12461:—Shrubs; stems few to several from the ground, ascending, 5 to 9 feet high, 1 to 3 inches thick, terete, branched from near the base; wood hard and tough, whitish, without odor or taste; bark light gray or whitish, more or less checked when old and thereby exposing the inner brownish epidermis, branches freely rebranched; leaves ascending, rigidly coriaceous, nearly flat, much paler or yellowish green beneath; inflorescence suberect or drooping, slightly but sweetly fragrant,

stalks greenish; calyx yellowish with red margins, ovary yellow, the other parts of the flower creamy white; fruits ellipsoid, 0.5 inch long, shining purplish black, edible but with a dry sorbic taste.

Represented by numbers 12461 in flower and 12149[b] in fruit, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, May and April respectively, 1910.

This scrubby *Eugenia* is very plentiful in hot sand gravelly soil of the Pauala river flat from 500 to 1000 feet elevation. Known to the local Visayan as "Lumboy" or "Mago-lumboy."

Eugenia submimica Elm. n. sp.

Suberect shrub; stem 5 to 8 cm. thick, 3 to 5 m. high, crooked, subterete, branched from below the middle; its main branches ascending, ultimately laxly and numerously rebranched; wood isabellinus toward the center, sappy white on the outside, odorless and tasteless, quite hard and heavy; bark smooth, yellowish white, avellaneus otherwise, the green portion of the twigs suberect, slender, angularly striate, the older branchlets terete. Leaves oppositely scattered along the branches, flat, ascending or horizontal, rigidly chartaceous, much lighter green beneath, subavellaneus when dry, margins entire, oblong or linear oblong, the larger leaves 9 cm. long by 4 cm. wide at the middle, glabrous even when young, frequently much smaller in size, gradually tapering to the bluntly rounded obtuse or acute apex, similarly tapering toward the base; midrib prominent beneath, minutely grooved above; lateral nerves oblique, quite evident from both sides, their ends united into a submarginal line, conspicuously connected with cross bars or reticulations; petiole 3 mm. long, also glabrous. Inflorescence erect, all the stalks pale green and angular, less than 5 cm. long, fully as wide, paniculately branched from below the middle, the middle peduncle stouter and longer, the lateral ones smaller; flowers solitary or few clustered from the ends of the slender 5 mm. long pedicels, the ultimate branchlets as well as the flowers subtended by mere apiculations; calyx tube turbinate, in the fruiting state urceolate, 5 mm. long, smooth, terete, greenish, the rim whitish, 2.5 mm. thick across the truncate top, very faintly 4-apiculate; petals white or tinged with pink, margins hyaline, imbricately folded

and forming a circular hood 2 or more mm. across or becoming separated before falling, eglandular, caducous, rotund or orbicular; stamens indefinite; filaments 5 to 6 mm. long, very much crinkled, subterete, the inner ones smaller, white; anthers more yellow, obscurely pointed at the apex, orbicular, attached on the back to the pointed filaments, 0.33 mm. long, emarginate at the base; style terete, 4 mm. long, several times thicker than the filaments; calyx cup or cavity one half the length of the entire tube; fruits 7.5 mm. long, 5 mm. thick across the middle; seeds 2, plano-convex, frequently unequal, 4 mm. long, when together short ellipsoid.

Type specimen 12904, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

Found growing in a sand gravelly flat along a small wooded stream at 500 feet altitude and located between the forks of the Iwahig river.

As its name implies it is near *E. mimica Merr.* but our leaves have more numerous lateral primary nerves and fruits only one half as large.

Eugenia davaoensis Elm. n. sp.

A large tree; trunk 1 m. thick, 15 to 20 m. high, not terete but more or less wadded, branched above the middle; wood whitish, hard, odorless and tasteless or with a slight bitter taste; bark gray on the branches, yellowish brown on the stem, peeling in thin plates; branchlets crooked, rigid, the ultimate ones rather numerous and erect, forming a flattish crown, usually checked transversely upon drying. Leaves rigidly coriaceous, ascending, oppositely scattered along the branchlets, avellaneus in the dry state, very dark green above, paler beneath, flat, the very abrupt acute points strongly recurved, base rounded and the lamina only slightly decurrent, the entire margins recurved in the dry state, grayish brown punctate or finely blistery beneath the average blades 5 cm. long by 3 cm. wide at the middle elliptic or obovately elliptic; midvein prominent beneath, deeply grooved above, glandular punctate; lateral nerves about 10, with alternating secondary ones, straight, divaricate, quite evident beneath, their tips united into a line 1.5 mm. from the edge, reticulations few and rather obscure; petiole 1 cm. long,

stout, deeply channelled along the upper side, blackish brown when dry. Inflorescence terminal, corymbose, 5 to 8 cm. long, branched from near the base; peduncles short, thick, obscurely angular, russet brown; branches opposite, quite numerous, the larger ones usually rebranched, angular, articulate, relatively thick and similar in color; flowers odorless, solitary or occasionally few clustered from the distal ends of the ultimate very short branchlets; calyx greenish white, shining, hard, turbinate, 1.25 cm. long, about as wide across the top including the calyx lobes, glabrous; the 4 segments subequal, 5 mm. wide, 3 mm. broad, thick except the smooth marginal portion, broadly rounded; petals also 4, whitish and tinged with a trifle red, oval, 7.5 mm. across, the entire marginal portion thinner, veiny and glandular punctate, reflexed in anthesis; stamens many, 1.25 cm. long, also glabrous, incurved in the young state, nearly straight and ascending in anthesis, subequal, subcompressed toward the base, much thinner at the apex, whitish; anthers yellowish, a trifle less than 1 mm. long, oblongish, the base falsely bilobed, attached dorsally and in the sinus, longitudinally dehiscent; style purplish toward the base, greenish toward the top, glabrous, terete, slightly longer than the stamens, nearly straight, stigma green; calyx rim thick, smooth and dark green.

Type specimen 11342, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, August, 1909.

Discovered this large and beautiful species in good well drained soil of a forested ridge of mount Calelan at 6000 feet altitude. "Magatungal" is the vernacular Bagobo name.

Not *E. benguetensis Elm.* because inflorescence more numerously branched; calyx slenderly turbinate; leaves more rigid, drying grayish brown instead of reddish brown, broadly elliptic or subrotund not oblong, both ends blunter especially the apex which is terminated by a short bluntly rounded acute point; nerves more numerous, more at right angles, straight and with thin tips united into a distinct submarginal vein.

Eugenia longiflora (Pr.) Vil.

Field-note for 12978:—A big burly tree; stem ascending, at least 3 feet thick, more or less wadded and crooked, 35 feet high or higher; wood hard, burly, heavy, odorless and tasteless,

only the thin sapwood whitish, otherwise badius brown; bark umber colored except the smooth gray with reddish brown mixed surface; main branches widely and crookedly spreading, ultimately numerously rebranched, forming dense masses toward the ends of the main branches which usually arise from the middle, the twigs lax and latericius; leaves descending mainly, coriaceous, recurved, shallowly folded upon the upper lucid and much darker green surface; inflorescence terminal, profuse, suberect, the main stalks isabellinus, the pedicels green, calyx bright green; petals white except the greenish tinged basal portion, strongly reflexed and subpersistent; stamens and style white as is also the cup portion of the calyx, anthers melleus; flowers faintly but sweetly fragrant.

Represented by numbers 12978 and 12753, *Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April and March respectively, 1911; numbers 12184 and 12260 from Sibuyan island were distributed under *E. marivelensis Merr.*

Quite common in woods or secondary forests from 250 to 750 feet altitude throughout the Visayan region.

Eugenia miquelii Elm. n. sp.

Tree; trunk 15 m. high, 5 dm. thick, terete; wood dirty white, hard, heavy, stringent in taste, quite odorless or only slightly fetid; bark smoothish, yellowish and gray blotched, that on the twigs cinnamon brown; main branches arising from the middle, widely spreading, ultimately numerously rebranched, forming a dense elongated crown; twigs ascending, very numerous, terete, testaceus. Leaves glabrous, opposite, mostly along the twigs, numerous, coriaceous, the upper ones ascending, the lower ones descending, similarly sublucid green on both sides, conduplicate on the upper side, the slender acuminate to caudate points strongly recurved, entire margins crinkled and a trifle involute in the dry brown state, the larger blades 7.5 cm. long by 2.5 cm. wide at the middle, oblongish, frequently much smaller and broadly lanceolate, base usually acute; midrib rather conspicuous beneath; lateral nerves indefinite, divaricate, equally visible from both sides, faintly united submarginally, reticulations as bold, few and subparallel; petiole 1 cm. long or less, glaucus reddish brown when dry, quite slender, shallowly grooved along

the upper side. Inflorescence terminal, erect, rather curt and congested, 3 to 5 cm. long, nearly as broad, oppositely branched from near the base; all the branchlets thick, short, terete, brown and very finely shredded, branched toward the distal end; flowers more or less clustered at the ends of the ultimate branchlets; calyx narrowly turbinate from base to basal portion of the segments, 6 mm. long by 5 mm. wide at the top including the sepals, smooth and green, subterete, lobes 4, equal, well separated, rotately spreading, broadly rounded, 2 mm. high, 3 mm. wide across the base, thick except the marginal portion; petals also 4, imbricately folded in the bud state, ultimately reflexed from between the calyx segments, early failing, greenish white, suborbicular, 5 mm. long, more or less constricted at the base into a very short and very broad claw, obscurely venose, eglandular; stamens white, very numerous, at first straight, ultimately interlaced, 1 cm. long, the inner ones unequally shorter, filiform, subterete, tips abruptly pointed; anthers orbicular, 0.33 mm. long, dorsifixed, minutely bilobed at the base, yellowish; style terete, whitish, equalling the longer stamens, very gradually narrowed toward the apex, nearly straight.

Type specimen 11240, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, July, 1909.

Collected in well drained soil of the wooded edges along the Baracatan creek at 2250 feet altitude. Marked as "Balagsam" in the Bagobo dialect.

Different from the northern *E. longiflora (Pr.) Vil.* and apparently very similar if not identical to the Javan *E. lineata (Blm.) Duth.* which however is antidated by one or two other species by that name. It is doubtful if ours is the Javan plant which according to some authors is the same as *E. cerasiformis (Blm.) DC.* Named in honor of the celebrated botanist, *F. C. W. Miquel.*

Eugenia robertii Merr.

Field-note:—Medium sized tree; stem slender, 45 feet long, 1 foot thick, terete, branched toward the top only; wood moderately soft, the thin sapwood pale white, otherwise reddish brown, odorless and tasteless; bark very smooth, grayish or yellowish white; branches numerous and relatively short, ascending,

forming a dense flattish crown; leaves ascending, coriaceous, folded upon the upper darker lucid green surface, tips recurved; flowers terminal, 1 to 3 usually; calyx and petals greenish white, the latter more whitish; filaments similar in color, anthers yellow.

Represented by number 12108, *Elmer*, Magallanes (Mt. Giting-giting), Sibuyan, March, 1910.

Gathered in damp somewhat gravelly soil of woods along the Pauala river at 750 feet altitude.

Eugenia banaba Elm. n. sp.

A small erect tree; stem 7 m. high and 2 dm. thick, crooked not straight, its main branches arising from near the middle; wood moderately hard, odorless and tasteless, dirty white, becoming reddish tinged toward the center; bark smooth, yellowish gray; branchlets widely spreading, the ultimate ones lax and somewhat drooping, terete, grayish brown. Leaves thinly coriaceous, mostly descending, flat or slightly recurved toward the blunt obtuse to acute apex, paler green beneath, glabrous, drying similarly dull brown on both sides, opposite, scattering along the branchlets, not numerous, oblong, at the base also obtuse to acute, the average blades 1 dm. long by 2 cm. wide at the middle, often larger or smaller, the entire edges more or less crinkled; midrib rather conspicuous beneath, faintly furrowed above; lateral nerves ascending, very obscure beneath, about 7 pairs, the basal pair running parallel with the margins and uniting with the ends of the other nerves 3 mm. below the edge, reticulations none; petiole 1 to 1.5 cm. long. Inflorescence terminal, much exceeded by the foliage, 3 to 5 cm. long; peduncle usually solitary, stout, smooth and green, when old grayish brown, only few branched above the middle, terete; buds globose, yellowish green, 1.25 cm. in diameter; flowers slightly odorous, solitary and sessile at the ends of the branchlets; calyx broadly campanulate, nearly 1 cm. high, 2.5 cm. wide with the segments, globose in the bud state, yellowish green, the basal pseudostalk very short; segments 4, persistent, in 2 unequal pairs, thick, ascendingly spreading, quite rigid, thinner toward the margins, short and broadly ovately rounded, the larger ones 1.25 cm. wide, 5 to 7.5 mm. high, the marginal portion yellowish white; petals ovately rotund or suborbicular, at least 1.5 cm. long,

spreading and easily falling, cremeus, thick toward the broad base, the numerous veins obscurely seen, densely pellucid glandular except toward the membranous margins; stamens very many; the outer or longer filaments 2 cm. long, the inner very much shorter, subcompressed, white, inwardly curved toward the apex, the basal portion closely contiguous, tips pointed; anthers 1.25 mm. long, oblong, dorsifixed between the bilobed sinus, pale yellow; style persistent, 1.5 cm. long, terete, succulent, whitish, the thinner apical portion usually curved; ovary top yellow, the smooth inner surface of the thick calyx rim reddish.

Type specimen 12146a, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Collected in shallow soil with a gravelly subsoil upon a wooded bench along the Pauala river at 750 feet. The local Visayan call it "Banaba."

Judging from the venation of the leaves, Forestry Bureau number 12806 is *E. vidaliana Elm.* the type of which is only in mature fruit; the specimens collected by *R. Rosenbluth* in the same province are the flowering specimens of this same species. Our present new species therefore does not match either of them in leaf or flower character. In the field it was easy to distinguish it from my number 12108 collected in this same region and which I take to be typical *E. robertii Merr.*

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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NEW APOCYNACEAE

By

A. D. E. Elmer

AGANOSMA G. Don.

Aganosma apoensis Elm. n. sp.

Scandent and forming tangled hanging bushes; stem 8 mm. thick, flexible, terete, freely rebranched, the ultimate ones covered with fine umber colored hairs, inclined to twine. Leaves well scattered, in whorls of 3, subcoriaceous, shining and deeper green on the upper glabrous surface, flat, recurved toward the obtuse apex which terminates into a sharp mucronate point, the entire margins subinvolute in the dry state, beneath soft umber brown pubescent, also obtuse at the base, oblong or the smaller ones obovate, drying dark brown, the larger blades 7 cm. long by 3 cm. wide across the middle, those toward the ends of the twigs much reduced, occasionally one in the whorl smaller; midvein densely pubescent beneath, sparsely so along the upper side; lateral nerves 5 to 7 pairs, divaricate, tips strongly curved and usually united, reticulations fine and quite obscure; petiole 1 to 2 cm. long or less, similarly brown pubescent. Inflorescence terminal or from the upper leaf axils, from 5 to 10 cm. long; longer peduncle 5 cm. long, densely olivaceus pubescent, subtended at the base by a whorl of foliaceous leaves; branches chiefly toward the distal end, verticellate, erect, subtended by very unequal oblanceolate pubescent bracts, the ultimate ones

much shorter; pedicels in umbellate clusters, 3 to 5 mm. long, spreading, densely puberulent, subtended by similarly pubescent bracts or bracteoles; calyx olivaceus pubescent on the outside, 3 mm. long, the basal one half united into a broad cup, the apical one half divided into 5 strongly recurved teeth, the segments rather narrow and glabrate at least on the upper side; corolla 5 mm. long, the basal one third united, puberulent on the outside, toward the base more or less 5-carinate; lobes 5, straight and valvate in the bud state, oblong, obtuse at apex, trinerved, tips incurved; stamens 5, alternating with the segments and inserted upon the corolla tube 1 mm. from the base; filaments slender, inwardly looped, 1.25 mm. long, glabrous or very faintly hairy toward the distal end; anther included, 2.5 mm. long, falsely united about the pistil, linear, abruptly constricted at the apex into a mucronate point, conspicuously bilobed or sagittate at base, basifixed from the inner side, introrsely dehiscent; ovary 1 mm. long, glabrous, conically globose; style 1.75 mm. long, slender, glabrous, strict, thinnest at the base; stigma mitriform, 1 mm. long, much thicker than its style; the 5 scales about the basal portion of the ovary free, 0.75 mm. long, 0.5 mm. wide, the truncate apex obscurely denticulate, glabrous, dark brown especially toward the base; ovules numerously crowded upon 2 placentae; follicle straight, 15 cm. long, strict, subterete, 5 mm. thick or thicker, blunt at the base, somewhat sharper at apex, the inner marginal side of the 2 carpels dividing it into 2 cells; seeds numerously arranged along a slender and membranous placenta, dull brown, flattened and somewhat twisted, 7.5 mm. long, the broadest end toward the base of the follicle, glabrous or only finely scaberulous, linearly oblong, gradually tapering toward the distal or coma bearing end; hairs umber brown, very fine and numerous, 1.5 cm. long, rotately spreading; kernel flattish, oblong and toward the distal end beaked.

Type specimens 12540 and 11719, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May and September, 1909.

Climbing in company with other climbers upon medium sized trees and forming interlaced spreading masses in humid forests at 4250 feet altitude near the junction of Mainit creek with the Sibulan river on the general route to Baclayan. The

former is "To-tot-tot" the latter "Tolling" in the Bagobo dialect.

On account of several very important characters it does not belong here and it may represent a new genus.

ALSTONIA R. Br.

Alstonia iwahigensis Elm. n. sp.

A middle sized tree; stem 6 dm. thick, strongly wadded toward the base, otherwise terete and nearly straight, 12 m. high at least; wood very light and soft, white and with a yellowish tinge or more yellow toward the center, odorless and with a slight bitter taste; bark dull brown and gray mixed, minutely checked, the middle portion yellowish brown, the inner side sappy white, containing on abundance of latex; main branches at the top, spreading and forming a flat crown, ultimately numerously rebranched; the branchlets subverticellate, soft, green, easily breaking, glabrous, the young portion wrinkled in the dry state. Leaves rotately spreading, similarly disposed, profuse, coriaceous, conduplicate on the upper shining deep green surface, glaucus green beneath, drying characteristically grayish or dull caesius, quite variable in size, gradually tapering to the obtusely rounded apex, base bluntly obtuse, the larger lamina 8 cm. long and 3 cm. wide across the middle, oblong, the entire margins slightly recurved or straight, glabrous; midvein raised beneath, sunken above; lateral nerves equally evident from both sides at least in the dry leaves, at right angles to the midvein, their tips distinctly united just under the margin, 25 to 30 pairs, reticulations none; petiole 1 to 1.5 cm. long, also glabrous expanded by the narrow continuation of the basal leaf portion. Inflorescence erect, always terminal; the 3 to 5 peduncles strict, green, 5 to 8 cm. long, somewhat angular or compressed, glabrous, or very finely puberulent toward the top, 1 to 3, verticellately branced from above the middle; the second branching 2 to 3 cm. above the first, the ultimate one short; flowers umbellately grouped at the ends of very short thick stalks which are themselves verticellately arranged, numerously subtended by pubescent bracts, the 3 mm. long pedicels densely olivaceus tomentose; calyx 3 mm.

long, short hairy on the outside, the basal one third pedicelled which in the fruiting state becomes elongated, the segmented portion narrowly cup shaped; teeth erect, ovate, 1.5 cm. long, glabrous on the inner side, valvate, united at the base; corolla tube 6 mm. long, 1 mm. thick, glabrous except the ciliate throat and tube to below the middle; segments 5, glabrous, ovately oblong and usually inequiteral, 3 mm. long, nearly as broad across the base, the upper basal portion occasionally hairy, rotately spreading; stamens 5, inserted 2 mm. below the throat; free filaments 0.5 mm. long, slender, glabrous; anthers 0.75 mm. long, ovately lance shaped, basifixed, subauriculate at the base; ovary glabrous, subglobose, 1 mm. in diameter; style slender, glabrous, 4 mm. long; stigma thickened especially about the base, more or less finely hairy; young fruits soft, terete, deep purple, ascendingly spreading, linear.

Type specimen 13167, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Of this species only one tree was found in fertile soil of humid forests at 750 feet altitude along the trail to Napsan on the opposite coast of the island.

Nearest to *A. angustiloba Miq.* of Java but follicles not pubescent and leaves smaller.

ALYXIA Banks.

Alyxia sibuyanensis Elm. n. sp.

A scandent and sprawling climber; stem bendable, terete, 1.25 cm. thick, with soft pale white wood and a large pith; bark grayish, smooth or peeling in thin flakes, white beneath the epidermis, full of latex; branches few, widely spreading, sparingly branched, slender and more or less hanging. Leaves in whorls of 4, widely scattering along the branchlets, ascending, flat or slightly recurved at the very blunt or obtusely rounded apex, thick and rigid, pale green on the upper side, much paler or yellowish green beneath, glabrous, drying greenish, the entire margins strongly bent upon the lower side, elliptic or oblong elliptic, the larger lamina 15 cm. long by 6 cm. wide across the middle, obtuse at the base; petiole 1 to 2 cm. long, glabrous, caniculate

along the upper side, the lamina more or less decurrent along the sides of the upper portion; midrib prominently raised beneath, yellowish green, impressed along the upper side; the lateral nerves numerous, strict, parallel, almost at right angles from the midrib, very faint, more evident on the upper side in the dry state. Flowers not seen; infrutescence axillary, spreading, upon short glabrous peduncles, few branched; fruiting stalks or pedicels ridged or more properly angular, subtended by whorls of small persistent bracts, 5 mm. long; fruits 1 to 3-beaded, ellipsoid, the fully mature ones nearly 2 cm. long, connected by similarly colored elongated constrictions, fusing from a yellow into orange red and finally claret color, the ultimate fruit bears an elongated mucronate point.

Type specimen 12137, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Of this rare species only one plant was discovered in shrubberies of light woods of red soil underlaid with river gravel stones along the Pauala river at 1000 feet. The local Visayan called it "Hapinla."

Only distantly related to *A. selangarica K. et G.* from which it can easily be distinguished vegetatively.

CARRUTHERSIA Seem.

Carruthersia leavis Elm. n. sp.

Scandent and sprawling over trees; stem twining, 2.5 cm. thick, terete, bendable, branched all along toward the top; wood yellowish white, odorless and without taste, very soft and porous; bark dirty brown, smoothish, testaceus beneath the epidermis; branches castaneus, terete, tough, numerously rebranched, forming interlaced masses, the glabrous twigs usually erect or nearly so. Leaves ascending, chartaceous, very dark green above and exceedingly lucid even in the dry state, paler beneath, only shallowly folded, tips acute to subacuminate and recurved, the young leaves much paler green, curing unequally brown or greenish brown, the larger blades 8 cm. long by one half as wide across the middle, ovately elliptic or broadly oblong, base obtusely rounded, the entire margins subinvolute at least

in the dry state, frequently much smaller than the above measurements, opposite; midvein latericius when dry, smooth, conspicuous beneath, channelled on the upper side of the surface; lateral 5 pairs similar in color and boldness, ascendingly curved especially toward the plainly interarching tips, reticulations faint and relatively coarse; petiole averaging 1 cm. long, glabrous. Inflorescence paniculate, terminal, about 5 cm. long, erect; peduncles usually 3, less than one half the inflorescent length, subtended by small leaves, very finely puberulent, yellowish green, reddish brown when dry; secondary branches from the middle, divaricate, subtended by foliaceous bracts, similarly puberulent; the ultimate branchlets toward the distal end, subtended by oblanceolate nearly glabrate bracts; the crowded flowers likewise subtended by linear glabrous bracts; calyx yellowish green, 3 to 5 mm. long, the basal portion stipitate, the upper 3 mm. tubular and campanulately spreading in anthesis or afterward, minutely pulverulent on the outside, smooth otherwise; segments 5, united toward the base, 3 mm. long, 1 mm. wide, straplike, unequal in size, flat, relatively thick, the roundly obtuse points recurved; corolla ochraceus, 3 mm. high, caducous, the basal two thirds united, crowned by 5 obtuse and recurved teeth, finely pubescent on both sides except toward the base; stamens similar in color, inserted upon the base of the corolla, syngenecious, 5; filaments broadly flattened, very short, glabrous; anthers 1 mm. long, linear, compressed, emarginately truncate at apex, caudately sagittate at base; style short, stigma top shaped, all glabrous except the bearded ovary top.

Type specimen 12837, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

This climbs tall trees and sprawls over their tops along the wooded banks of the Iwahig river at 1000 feet altitude where it can be seen hanging in large masses.

Carruthersia daronensis Elm. n. sp.

Scandent and straggling; stem numerously branched, the ultimate ones subpendulous; wood soft, flexible, porous, greenish white; bark brown, smooth, with a greenish white sap; twigs terete, dark brown and with lighter colored lenticels, more or less twining, the young portion covered with short isabellinus

colored strigose hairs. Leaves subcoriaceous, deep green on the sublucid glabrous upper surface, much paler beneath, shallowly conduplicate, horizontally spreading, oppositely scattered along the branchlets, curing unequally dark brown, diverse in size, entire, apex obtuse to sharply acute, base obtuse to obtusely rounded, the small blades oblong, the larger ones elliptic, at first slightly strigose beneath especially along the nerves, ultimately glabrous except the midvein, the larger leaves 1 dm. long by 6 cm. wide at the middle; midrib stoutly raised and yellowish gray hairy beneath, smooth and minutely caniculate on the upper side; lateral pairs 4 to 6, ascending, tips curved and reticulately united, brown, ultimately glabrous, the rather fine reticulations evident only from below; petiole slender, olivaceus hairy, caniculate on the upper side, the larger 1.5 cm. long, the smaller leaves scarcely 5 mm. long. Inflorescence erect or subpendant, terminal, racemosely elongated, oppositely or subverticellately branched all along, 1 to 3 dm. long, yellowish green and in the dry state covered with a latericius tomentum; branches strict, ascending or the lower and longer ones more spreading and subtended by foliaceous bracts, the upper ones subtended by more or less pubescent and acute bracts, the larger branches 1 dm. long and rebranched from above the middle, all angular or striate at least when dry; flowers creamy white, crowded along the short thick ultimate branchlets, densely subtended by subpersistent bracts, odorous; pedicels few mm. long, pubescent, subtended by a similarly pubescent rather large ovately acute persistent bract, calyx proper 2 mm. long, terete, also pubescent, 1.5 mm. thick, the 5 obtusely pointed segments nearly one half as long and erect, alternating with the glabrous appendages; corolla 6 mm. long, the basal one half barrel shaped and subglabrous, in the bud state imbricate but scarcely twisted; segments averaging 4.5 mm. long, rotately spreading from the hairy throat, more or less pubescent on both sides toward the thick base, otherwise nearly glabrous except the few ciliate hairs along the edges, the basal one half ovately oblong, the distal portion linear, one side at the middle truncate and from that point twisting and curved; stamens 5, erect, subsessile, inserted 1 mm. from the base; anthers 1.25 mm. long or less, flattened, abruptly apiculate at apex, base truncate, faintly 2-auriculate, 0.75 mm. wide;

ovary obovoidly subglobose, glabrous; style 1 mm. long, glabrous, occasionally bifid at apex.

Type specimens 11099 and 10926, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, June and July, 1909.

Overtopping wooded ravines along the Baracatan creek at 1500 feet altitude or in the upper cogon limits. Quite common and known by the Bagobos as "Cari."

Nearest to *C. pilosa A. DC.* yet easily distinguished by its leaves and flowers.

Carruthersia kindleyi Elm. n. sp.

A subscandent and sprawling shrub; twigs terete, when young olivaceus puberulent but soon becoming glabrate. Leaves opposite, widely scattering along the branches, ovate to ovately oblong, apex acuminate, base shallowly cordate, the entire margins subinvolute in the dry state at least, the old blades glabrous except the nerves on the nether side, lucid above, the average blades 17.5 cm. long by 1 dm. across the middle or below it; midvein very stout on the lower side and usually covered with similarly colored strigose hairs, glabrous and grooved along the upper side; nerves about 7 pairs, also bold, divaricate, the basal pair less conspicuous, much ascendingly arched toward their tips, interarching or reticulately united, similarly pubescent, cross bars and coarse reticulations quite evident and minutely strigose; petiole 3 to 5 cm. long, stout, subterete, especially hairy on the upper more or less flattened surface. Inflorescence terminal or from the uppermost leaf axils, erect; peduncles 5 to 10 cm. long, stout, straight, subterete, finely olivaceus pubescent, usually solitary, once or twice verticellately branched; main branches 3 cm. long, subtended by similarly short pubescent bracts, secondary branches much shorter, thick, provided by acute or obtuse ciliated bracts; calyx 3 mm. long, nearly 2 mm. thick across the middle, the basal portion stipitate and subtended by a pair of bracts, glabrate except the 5 ciliate segments which are 1 mm. long and roundly pointed, on the basal inner side with few flattened short linear appendages; corolla tube 1 cm. long, obscurely inflated toward the base, the segmented portion short ovoid and imbricately twisted from right to left in the bud state, glabrous on the outside, dingy hairy on the

inner side from the throat down toward the stamens and short densely white hairy just below the stamens; segments 5, averaging 1 cm. long, rotately spreading, narrowly oblong or oblanceolately oblong, glabrous or short hairy on the upper side toward the throat; stamens 5, erect and forming a sort of a tube 2 to 3 mm. from the base; filaments 0.33 mm. long, glabrous or only finely hairy; anthers 2 mm. long, truncate and subauriculate at the base, lanceoloid, compressed, gradually tapering to a sharp point, ventrally dehiscing; style about 1 mm. long, terete, the stigmatic portion twice as long and as thick at the base, coming to a sharp point, ultimately apparently becoming 2-cleft.

Type specimen 7833, *A. D. E. Elmer*, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May, 1907.

Collected in shrubberies of light woods shirting the base of Banahao at 2000 feet altitude. Dedicated to *Mr. Geo. C. Kindley*, the supervising teacher at Lucban who has shown me numerous favors.

Distributed as *C. pilosa A. DC.* but not at all that species.

CHILOCARPUS Blm.

Chilocarpus leytensis Elm. n. sp.

A sprawling and subscandent shrub; twigs shining green, black when dry, subterete, glabrous, slender. Leaves oppositely scattered along the branchlets, nearly flat, with abruptly acute or acuminate recurved tips, acute to obtuse at the base, entire margins in the dry state subinvolute, elliptically oblong, beneath avellaneus when dry and blackish brown on the upper shining side, glabrous, the normal blades 1 dm. long and 4 cm. wide at the middle; midvein raised beneath, grooved on the upper side toward the base; lateral nerves divaricate, parallel and straight, also conspicuous, tips interarching and forming a submarginal line 2 mm. from the edge, toward 20 pairs, reticulations or cross bars none; petiole 1 cm. long, slender, glabrous channelled along the upper side; stipule absent. Fruits few clustered along the distal portion of the ligneous 5 cm. long axillary spike or infrutescence longer and few branched, ovoidly oblong, dry and

green, glabrous, subterete, apex conspicuously pointed, 5 to 7.5 cm. long, 2 to 3 cm. thick below the middle or across it; seeds many, irregular in shape, varying from 5 to 8 mm. across, brownish black when dry, smooth.

Type specimen 7359, *A. D. E. Elmer*, Palo, Leyte, January, 1906.

Distributed as *C. atroviridis Blm.* but apparently a distinct species.

Chilocarpus globosus Elm. n. sp.

Scandent and woody; stem terete, 1.25 cm. thick, bendable, more or less branched all along; wood white, moderately soft and tough, bitterish, odorless; bark yellowish gray, smoothish or minutely lenticelled, the young green bark with latex; branchlets slender, occasionally rebranched, the glabrous apical portion suberect. Leaves opposite, widely scattering along the branchlets, glabrous, thinly coriaceous, horizontal or descending, flat or shallowly folded, the entire margins irregularly wavy, much lighter green beneath, oblong or oblong elliptic, the blades 14 cm. long, 6 cm. wide across the middle, abruptly terminated by obtuse or acute blunt points, base mostly obtuse, drying brownish; petiole dark reddish brown when dry, glabrous, 1 cm. long; midrib similarly colored, prominent beneath, with 10 to 14 faint lateral pairs, reticulations quite evident and more numerous toward the ends of the lateral nerves. Flowers not seen; fruits terminal or from the uppermost leaf axils, mostly solitary, upon thick 1.25 cm. long stalks, globose, 3.5 cm. in diameter, shining green, with a white gummy juice, containing several crustaceous brown seeds which are imbedded in a whitish pulp.

Type specimen 12229, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

This tall tree climber inhabits moist rich soil of a forested flat along the Patoo river at 750 feet. The natives or Visayan call it "Bulacan."

Judging from description it must be close to *C. nigrescens K. et G.* from Perak.

HALORRHENA R. Br.

Halorrhena daronensis Elm. n. sp.

A small erect tree, 6 m. high and with a 2 dm. thick stem; wood moderately soft, white, odorless, with a distinct sweetish taste; bark smooth, whitish mottled, with milky sap; main branches arising above the middle, ascending, ultimately numerously rebranched and forming a dense crown; twigs smooth, glabrous, shining brown, ascendingly curved, quite lax. Leaves coriaceous, horizontal or descending, shallowly folded, with abruptly constricted recurved bluntly rounded acute tips, shallowly folded upon the upper sublucid side, much paler green on the lower surface, the entire and slightly involute margins occasionally somewhat wavy, base acute to subcuneate, oblong, oppositely scattered along the branchlets, glabrous, drying unequally brown on the 2 sides, the larger blades 1 dm. long by 3.5 cm. wide at the middle, frequently smaller; midrib deep brown and conspicuous beneath; lateral nerves 5 to 7 pairs, relatively prominent beneath and of the same color, divaricate, strongly ascendingly curved, only faintly united, reticulations very obscure; petiole dark brown when dry, 1 cm. long, glabrous, finely grooved above. Infrutescence terminal or appearing from the lowermost leaf axils, pendant, upon stout terete 2.25 cm. long peduncles, always in pairs; follicles 5 dm. long, usually curved and twisted, angularly terete, gradually tapering toward the apex; seeds very linear, densely covered with brownish or silky hairs.

Type specimen 11912, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, October, 1909.

Found in dry woods along the Baracatan creek at 2000 feet altitude. "Tacan" is the Bagobo name.

Possibly it belongs to *Kickxia Blm.* but is a different species from *K. macgregori Elm.*

KICKXIA Blm.

Kickxia gitingense Elm. n. sp.

A middle sized tree; stem 3 dm. thick, terete, 12 to 15 m.

high, branched toward the top mainly; wood odorless and tasteless, moderately soft; bark smooth or finely and irregularly checked, mottled, with an abundance of latex; twigs numerous, lax, shining, brown, the glabrous green ultimate portion turning black while drying. Leaves coriaceous, also ascending, shallowly folded upon the upper very deep green and lucid surface, paler green beneath, glabrous, drying unequally brown on the upper and lower sides, the otherwise entire margins somewhat wavy, lanceolate, the acuminate apices recurved, base cuneate or attenuate, occasionally a trifle falcate, the average blades 1 dm. long by 2 cm. wide a trifle below the middle, frequently much smaller, opposite, numerous; mid vein conspicuous and brown beneath; lateral nerves 5 to 7, divaricate, very obscure, forked or arching toward the ends, reticulations few and nearly obsolete; petiole 1 cm. long, angular. Inflorescence arising terminally, eventually appearing between the branches, umbellately clustered upon a very short and stout peduncle; calyx 1 cm. long, green, the upper 2 mm. campanulate and fully as wide, otherwise slender and glabrous; segments 5, united at the base, ovately oblong, imbricate, straight, puberulent especially along the edges, obtuse at tip; corolla creamy white, tube 5 mm. long, flask shaped, 3 mm. thick just below the middle, retrorsely hairy below the stamens; segments 5, rotately spreading, 1 cm. long, ovately lanceolate, finely hairy especially on the upper side toward the base, 3 mm. wide below the middle, usually with a few glands on the upper basal portion; stamens 5, erect, upon the throat of the corolla, subsessile; anthers flattened, 1.5 mm. long, 0.75 mm. wide at the base, slightly tapering to the irregularly truncate apex, connective glandularly thickened on the back near the base, on the middle ventral side with 1 or 2 woolly glands; pistil greenish; ovary glabrous, subglobose, 1.5 mm. in diameter; style very slender, 5 mm. long, also glabrous, usually curved; stigma 1 mm. long, thickened, obscurely ringed at the base.

Type specimen 12203, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

In red sticky soil of a forested bench at 1250 feet altitude. **Rare!**

Kickxia macgregori Elm. n. sp.

A rather small or middle sized tree; stem 2 dm. thick, 8 m. high or higher, branched above the middle; wood yellowish white, very soft, bitter, odorless; bark roughened with obscure lenticels, brown when old, grayish mottled toward the top; branches numerously and laxly rebranched, glabrous, the shining yellowish brown portion slender and more or less drooping. Leaves opposite, scattered, thinly coriaceous, shining deep green above, much paler or even yellowish green beneath, margins entire or somewhat wavy, gradually tapering to the acute apex, obtuse at base, flat, the 2 sides drying unequally brown, lanceolately oblong, the normal blades 1 dm. long by 2.5 cm. wide a trifle below the middle; midrib raised beneath, sunken above; lateral nerves about 10, usually with glands in their axils, divaricate, very fine, equally visible from the upper side, tips only faintly united, reticulations nearly obsolete; petiole 5 to 10 mm. long, glabrous, deeply channelled. Flowers usually in pairs from the leaf axils, upon a 3 mm. long peduncle, odorless; calyx 1.5 to 2.25 cm. long, light green, subtended at the base by glabrate bracts, the upper 3 mm. 5-segmented, otherwise stalk-like, glabrous; lobes united at the base, imbricate, not twisted, the median portion thickened, 3 mm. long, ovately rotund, apex usually pointed; corolla tube 2 cm. long, expanded and greenish at the base and toward the throat, glabrous except the throat and in the stamineal region; segments 5, white, rotately spreading in flower, 3 cm. long, unsymmetric, oblongish, acute at apex, narrowed toward the base, glabrous except on the upper basal portion, 1 to 1.5 cm. wide at the middle or below it; stamens 5, erect, sessilely inserted 5 mm. below the throat; anthers 4 mm. long, rigid, 1 mm. wide at the base, gradually tapering to the very sharply pointed apex, glandular on the back at the base, minutely sagittate at base, cells dehiscing on the ventral side above the middle, with a finely woolly grayish gland in the middle region toward the base; ovary glabrous, surrounded by a rim; style greenish white, 1.5 cm. long, glabrous; stigma 2 mm. long, thickened especially about the base.

Type specimen 12373, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Discovered in rocky soil of a damp deeply wooded cut along a streamlet at 1750 feet along the trail toward España. Named after *Mr. Richard C. McGregor* who first collected it.

LEPINIOPSIS Val.

Lepiniopsis philippinensis Elm. n. sp.

Slender tree; stem 2 dm. thick, 8 m. high, branched from above the middle or toward the top only; branchlets slender, freely bleeding with latex, divaricately spreading, the ultimate ones lax and very flexible, the terminal glabrous portion suberect; wood sappy white or yellowish toward the center, odorless, soft, bitterish; bark smoothish and more or less mottled. Leaves, ascending, glabrous, shallowly folded upon the upper deep green surface, paler beneath, thickly coriaceous, drying dull brown, alternatingly clustered toward the ends of the twigs, oblong but usually a trifle wider in the upper one half, the average blades 12 cm. long by 4 cm. wide, abruptly acute to acuminate and recurved at the apex, obtuse or subcuneate at the base, the entire margins when dry more or less involute, the smallest leaves obovately lanceolate; midrib boldly raised beneath, sunken on the upper side; lateral nerves divaricate, very minute beneath, on the upper surface appearing as if reticulately branched; petiole also glabrous, somewhat compressed, 2 cm. long. Inflorescence usually arising in subwhorls at the ends of the young branchlets, appearing lateral; peduncles varying from 3 to 5 cm. long, stout, strictly ascending or erect, dark green, rigid, glabrous, few dichotemously branched toward the end or at least from above the middle, the ultimate branchlets very short; flowers arising from the very thick yellowish gray and more or less concentrically scaly flower and fruit bearing ultimate portion; calyx 2.5 mm. long, broadly elliptic, glabrous; segments straight, rather thick, imbricate, 5, more or less united at the base, obtuse at apex, ovately oblong; corolla tube reddish and cylindric, 7.5 mm. long, 1.5 mm. thick, glabrous except the pubescent region below the stamens which cause a slight bulge at about the middle; segments as many as calyx segments, yellowish, rotately spreading, ligulate, 1.5 mm. wide, at least 5 mm. long; stamens

5, inserted at the middle of the tube, erect; filaments 0.33 mm. long, glabrous; anthers 1.5 mm. long, subcompressed, lance shaped or truncate at the minutely auriculate base; ovary conical, glabrous, 1 mm. long; style very slender, 3 to 5 mm. long, glabrous; stigmatic portion less than 1 mm. long, conically pointed, at the base surrounded by a brush of fine hairs; fruits few, divergent, ellipsoid, 1.5 cm. long, less than 1.25 cm. thick across the middle, purplish black, with a single stone-like seed.

Type specimens 12378 for flower and 12062 for fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April and March respectively, 1910.

Often observed in wooded flats or upon wooded river banks from 500 to 1500 feet elevation. Common on northern Sibuyan but it is not known outside the central Visayan region.

This monotypic genus is based upon material supposed to have been collected on the island of Ternate. Our fruits are thicker and only one half as long, flowers much shorter and differently shaped than on herbarium material from Buitenzorg. The flower and fruit bearing portion is also shorter and the stalks not winged as in the Javan specimen.

MELODINUS Forst.

Melodinus apoensis Elm. n. sp.

A tree climber; stem round, 2.5 to 4 cm. thick, crooked, branched, the branchlets spreading; bark dirty yellowish, roughened with tubercles and lenticels, the young bark with latex; wood yellowish, hard, odorless and tasteless; twigs terete, green, subpendulous, with ascending tips, rather coarse and heavy, densely brown puberulent, 5 mm. thick. Leaves descending, oppositely scattered along the branchlets, the more distal ones smaller, rigidly coriaceous, lucid dark green on the upper more or less folded surface, curing blackish brown, nearly glabrous above, sparsely cinereous beneath in the young ones and glabrate when old, gradually tapering to the strongly recurved acute to acuminate apex, base broadly rounded, ovately oblong, the entire margins slightly recurved in the dry state at least, the larger blades 15 cm. long by 6 cm. wide below the middle, frequently

much smaller and becoming broadly lanceolate; midrib stout, sunken on the upper surface, crinkly tomentose on both sides; lateral nerves 10 to 15 pairs, slightly oblique, strict, their tips only faintly united, at first sparsely hairy on both sides but soon wearing glabrate; reticulations equally plain from both sides; petiole stout, 1 cm. long, tomentose, thickened at the base, shallowly grooved along the upper side. Inflorescence green, suberect, terminal, numerously paniculately branched, 1 dm. long and about as wide across the base, often smaller and occasionally longer, the lower branches arising from the uppermost leaf axils, numerously rebranched from the middle or above it, all the stalks rigid, slightly compressed and cinereous or densely brownish tomentose, the ultimate ones short and subtended by bluntly pointed similarly pubescent 3 mm. long bracteoles; pedicel stout, also grayish hairy, subsessile or 8 mm. long and then bracteate; flowers faintly but sweetly fragrant, forming a dense corymbose panicle, calyx campanulate, 5 mm. high, greenish; the 5 segments united at the base, yellowish gray tomentose on the outside, only strigose on the inner, subequal, imbricate, straight, rotund, thick and rigid, the margins relatively thin, without glands, corolla buds clavate, the upper one half strongly imbricate and twisted toward the left, yellow, nearly 3 cm. long; tube hairy within except the base which is glabrous interiorly and exteriorly, puberulent on the outside otherwise; segments 5, glabrate on the inner side, pulverulent on the outer, obovately oblong, occasionally only slightly inequilateral, at least 1 cm. long, rotately spreading, rather thick, at the throat subtended by fascicles of appendages; stamens inserted 5 mm. from the base of the corolla base; anthers 2.5 mm. long, bifid and rounded at the base, basifixed, slenderly tapering from base to the acuminate apex; filament 0.5 mm. long, glabrous or with few hairs; ovary oblong conical, smooth; style relatively slender, also glabrous; stigma enlarged and terminated by prongs; cells 2, with a flattened fleshy placenta in each and which bears numerous ovules; fruit not seen.

Type specimen 10793, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Collected in good soil of a forested ridge leading from *Dato Tongcaling's* settlement to mount Calelan at about 3750 feet altitude. The Bagobos called it "Balow."

This is the third endemic species, differing entirely from *Cuming* 1831 from Bohol or *M. cumingii A. DC.* and from *Cuming* 1574 from Mindoro or *M. philippinesis A. DC.*

OCHROSIA Juss.

Ochrosia apoensis Elm. n. sp.

An erect tall tree; trunk 6 dm. thick, 15 m. high; branches spreading from above the middle; twigs branched, subverticellate, easily breaking, the ascendingly curved green portion glabrate; wood soft, yellowish white throughout, with a distinct bitterish taste, odorless, easily splitting; bark brown, densely beset with lenticels. Leaves opposite or in whorls of 3, mostly toward the ends of the twigs, very smooth, flat, ascending, dark green above and turning blackish while drying, paler or yellowish green beneath and dark brown when dry, the entire margins subinvolute, apex acute, base cuneate, oblanceolately oblong, the larger blades 1 dm. long by nearly 3 cm. wide above the middle; the lower surface minutely blistered; midrib prominent beneath, caniculate on the upper surface; lateral nerves about 15 on a side, subdivaricate, not conspicuous, strict, their tips united into an intramarginal line reticulations few and scarcely visible; petiole 1 to 1.5 cm. long, glabrous, the upper part flattened by the decurrent leaf bases. Inflorescence pale green, 1 to 3 cm. long, glabrous, few dichotemously branched from above the middle; the ultimate portion flower bearing, short and divaricate; the flowers subtended by small bracts and leaving large yellowish gray scars after falling, subsessile; calyx glabrous, cup shaped, 5 mm. long, 3 mm. across at the top, the basal portion provided with few to several short thick very unequal bracts; segments also thick, glabrous, rotundly oblong, imbricate, united about the base; corolla tube cylindric, 7.5 mm. long, 2.5 mm. thick glabrous except the finely hairy region below the stamens; bud as long as the tube, erect, oblong, the 5 segments strongly imbricate but not twisted, thick and rigid, linearly oblong, at base occasionally lobulate, apex rounded; stamens also 5, inserted upon the middle of the corolla tube; free filaments 1 mm. long, glabrous; anther 1.5 mm. long, gradually tapering

from the somewhat bilobed and inwardly curved base to the sharply pointed apex, subbasifixed; ovary 1 mm. long, conical, glabrous; style slender, stigma enlarged; fruits upon 2 to 4 cm. long rather thick brown stalks, smooth, hard, green, containing 2 obliquely set flattened stones, slightly compressed and ends oppositely curved, 5 cm. long when dry, one half as wide across the middle, ellipsoid, abruptly terminating into a stout and sharply acuminate apex, also more or less lenticelled.

Type specimen 10478, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

Discovered in damp fertile soil of dense forests at 4000 feet altitude. The Bagobos call it "Magsangod."

Approaching *O. acuminata T.* et *B.* but sufficiently distinct.

RAUWOLFIA Plum.

Rauwolfia palawanensis Elm. n. sp.

A small and rather slender tree; stem 2 dm. thick, 8 m. high, branched from the middle; main branches suberect, rebranched and forming a flattish crown; wood dingy or yellowish white, moderately hard, odorless, very bitter; bark coarsely lenticelled, yellowish and gray blotched, the inner portion yellow, greenish beneath the epidermis; branchlets ascendingly curved, yellowish, with viscid milky sap, glabrous, the ultimate green portion covered with excrescences. Leaves coriaceous, shining and bright green above, much paler beneath, glabrous, flat or only the acute or obtuse tips recurved, cuneate at the base, obovately oblong, opposite, usually crowded toward the ends of the twigs, the entire margins slightly recurved in the dry state, the average blades 5.5 cm. wide a trifle above the middle, 16 cm. long, curing unequally brown; midvein bold beneath, channelled above, glabrous; lateral nerves divaricately pinnate, the 30 primary ones usually alternating with obscure secondary ones, tips united into a distinct submarginal line, relatively obscure yet quite evident from beneath; petiole deeply grooved, likewise glabrous, the lower side minutely lenticelled, 2 cm. long or less. Inflorescence erect; the main stalk stout, greenish, 3 to 5 cm. long, obscurely angular

when dry, verticellately branched; the secondary stalks longer, slender, also angular when dried, finely lenticelled as is also the peduncle, similarly verticellately branched; the ultimate branchlets short, 2 to 3 subverticellately branched, glabrous, ebracteolate; pedicels slender, 5 mm. long, whitish; calyx glabrous, the upper 2 mm. broadly cup shaped and nearly twice as broad, white, segments imbricate, not twisted, orbicular or ovately rotund, glabrous on both sides; corolla broadly tubular, 6 mm. long, glabrous except the puberulent upper side of the segments and the villose tube from the throat down toward the base, 3 mm. thick, similar in color; segments broadly orbicular, imbricate, straight, 2 mm. across; stamens also 5, included, subsessilely attached 1.5 mm. below the throat; anthers 1.25 mm. long, compressed, gradually tapering from the rounded or minutely auriculate base to the rather fine apical point; ovary glabrous, white, conically globose, 1.25 mm. across; style whitish, slender, also glabrous, 2 mm. long; stigma much enlarged, 0.5 mm. long, ringed around the base, green; fruit upon 8 mm. long pedicels, shining, more or less irregularly globose, 1.25 cm. in diameter, usually with only a single flattened stone-like seed, pale white when mature.

Type specimen 12591, *A. D. E. Elmer*, Brooks Point (Addison Peak), Palawan, February, 1911.

Discovered in a somewhat swampy flat of wet black soil at 15 feet altitude in the woods some little distance from the coast. Called by the Tagbanuas "Bubuta."

This species is similar to *R. madurensis Burck.* from Madura.

TABERNAEMONTANA Linn.

Tabernaemontana biflora Elm. n. sp.

A laxly branched 2 m. high shrub; wood quite hard and brittle, heavy, whitish, odorless and tasteless, finely grained; bark greenish brown, roughened with wart-like excrescences, containing latex; branches lax and quite brittle, horizontally spreading especially on the river side, glabrous, the ultimate ones ascendingly curved, also lenticelled. Leaves submembranous, curing greenish brown, glabrous, lucid deep green above, yellowish so beneath, the entire margins slightly involute when dry, apex sharply acu-

minate and strongly recurved, subcuneate at the base, in opposite subequal or very unequal pairs, the larger blades 17 cm. long by 6 cm. wide at the middle, oblong, the smaller ones 3 cm. long and lance shaped; midrib reddish brown and conspicuous beneath, grooved below the middle on the upper side; the normal leaves with 7 to 10 lateral pairs, divaricate and a trifle curved, their tips strongly curved and faintly united, reticulations rather coarse and very faint; petiole 5 to 15 mm. long, also glabrous, caniculate. Flowers in pairs or occasionally in triplets, terminal, odorless, sessile; calyx green, slenderly tubular, curved, 4 to 7 cm. long, gradually thickened toward the distal end, glabrous on the outside at least, the terminal portion 4 mm. thick and crowned by 5 oblong and obtusely pointed 2 mm. long teeth, about 3 or 4-pointed appendages on each of the ventral basal portion of the segments; corolla nearly 2 cm. long, 4 mm. thick, also glabrous; corolla lobes 5, white except the greenish basal portion, rotately spreading, oblongish, 1 cm. long and one half as wide across the base or the widest portion, one side at the middle abruptly oblique or occasionally lobulate, that portion below the middle veiny and thickened on one side, the upper portion thin and margins crinkled; stamens 5, included below the throat, erect; filaments 0.5 mm. long, glabrous; anther lance shaped, 2 mm. long, flattened, basifixed, 0.75 mm. wide below the middle, ventrally dehiscent; pistil 7.5 mm. long, glabrous; ovary 2 to 3 mm. long, somewhat compressed, the 2 cells only falsely united, each with numerous ovules; style as long, parted toward the base; stigma terete, united, pointed, 1.5 mm. long.

Type specimen 10657, *A. D. E. Elmer*, Todaya (Mt. Apo), District of Davao, Mindanao, May, 1909.

An undershrub of rare occurrence on very steep moist wooded ravines along the Sibulan river at 3000 feet altitude. "Sali-bot-bot" is the native or Bagobo name.

Tabernaemontana congestiflora Elm. n. sp.

A small erect tree; stem terete, 2 dm. thick, 8 m. high; main branches from the middle, divaricate, amply rebranched, the yellowish gray twigs glabrous and excrescently lenticelled; wood soft, nearly white, bitterish, with latex. Leaves opposite, very or only slightly unequal, glabrous, flat or only the abruptly

acuminate apex recurved and usually somewhat curved, oblongish, the base broadly obtuse, the larger blades 16 cm. long by 6 cm. wide across the widest or middle portion, margins entire, nearly black on the upper side when dry, brownish beneath, the smaller blades 3 cm. long and subelliptic; midvein prominent beneath and yellowish brown on our specimens, grooved on the upper side especially toward the base; lateral nerves 7 to 12 pairs, divaricate, similar in prominence and color, tips ascending but not united, reticulation obsolete; petiole 1 cm. long, also glabrous, the basal axillary portion bearing a thick stipular-like membrane. Flowers in short cymose clusters from the lower leaf axils; branches thick, glabrous, less than 1 cm. long, usually curved; flowers clustered mostly on the upper side toward the distal ends of the short branchlets, leaving large yellowish white scars after falling; calyx tubular, greenish, about 1 cm. long, subtended at the base by minute bracteoles, at the top somewhat thickened and terminated by 5-apiculate teeth; corolla tube cylindric, glabrous and striate, yellowish, about as long as the calyx; segments 5, rotately spreading, nearly as long as the tube, narrowly oblong or broadly ligulate, also glabrous, veiny, averaging 3 mm. wide, cremeus; stamens 5, in the middle of the corolla tube, erect; filaments 1 mm. long, glabrous; anthers 2 mm. long, linear, compressed, sharply pointed, 0.5 mm. wide, basifixed, minutely lobed at base; style nearly 5 mm. long, very slender, glabrous; stigmatic portion 1 mm. long, subcolumnar, around the base provided with a sort of a brush.

Type specimen 12564, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Collected in compact red soil of a wooded ridge at 1000 feet elevation near the Pauala river.

Very near to *T. mucronata Merr.* but our leaves average larger, inflorescence more congested and with corolla segments twice as long. The fruits of both species are unknown.

WRIGHTIA R. Br.

Wrightia hanleyi Elm. n. sp.

A low erect shrub; stems several or few from the same

root cluster, 1.25 cm. thick at least, 1 to 2 m. high, branched toward the top only; wood quite hard and tough, white, without odor or taste; bark gray, with lighter gray lenticels, the hypodermis green, brown, smooth and minutely checked on the branches; twigs rebranched, very flexible, the young green portion glabrous. Leaves oppositely scattered along the branchlets, mostly descending, coriaceous, glabrous, drying dull green or yellowish so beneath, folded upon the upper much deeper green surface, the abruptly acute to acuminate tips recurved, otherwise flat, very unequal in size, obtuse to acute at base, the dry entire margins subinvolute, elliptic to oblongish, the larger blades 1 dm. long by one half as wide across the middle, frequently only 3 cm. long, the young ones drying reddish brown; midvein conspicuous beneath, caniculate above; the lateral pairs about 7, divaricate, slightly curved, tips strongly curved and faintly united, reticulations fine and rather obscure; petiole 5 mm. long, also glabrous, widely furrowed along the upper side. Inflorescence terminal, always dividing the branches, green even in the buds, subglabrous, 1 to 2 cm. long, with few cymose paniculate branches from below the middle, the solitary peduncle very short; branchlets subtended and provided with ample bracts; these are persistent, glabrous, yellowish green, sharply pointed; pedicels 1 to 3 mm. long, subtended by bracteoles; flowers erect and odorless; calyx glabrous, the basal 1 or more mm. stipitate, subtended by a pair of bracteoles, the segmented portion 2 mm. long, erect and quite rigid, imbricate, straight lobes ovately obtuse, united at the base; corolla also united about the base, 5-lobed, glabrous, 6 mm. long by one half as wide, oblongish, fleshy; appendaged in the sinus of the segments, sulphureus, the upper side overlaid with a rugose fleshy red membrane except around the apical portion, nearly flat and usually twisted, finely pulverulent on the dorsal side; stamens 5, yellow, erect in a column, inserted upon the throat; anthers subsessile, subterete, nearly 1 mm. wide, linear, truncate at both ends, ventrally dehiscent above the middle, the connective toward the base much thickened or ridged on the upper side, with a whitish excrescence on the ventral side a trifle above the middle; ovary globosely conical, glabrous; style whitish, 3 mm. long, with a 1 mm. long stigma which is constricted at about the middle, terete, thickened toward the stigmatic base; pods in pair,

subterete, pendant, dark green, 1.5 dm. long at least, usually curved, upon short thick pedicels, gradually pointed toward the apex, 1-celled; seeds many, subterete, linear, 8 mm. long, strongly wrinkled when dry, greenish in the dry state, at the lower or basal end provided with a pure silky white coma of very soft hairs.

Type specimen 12873, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, March, 1911.

In dry thin woods or in shrubberies of compact gravelly soil at 250 feet altitude. Not at all common. Named after *Mr. Thomas Hanley*, agriculturalist for the Iwahig Penal Colony.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

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FOUR NEW DIPTEROCARPACEAE

By

A. D. E. Elmer

HOPEA Roxb.

Hopea foxworthyi Elm. n. sp.

A handsome middle sized tree; stem 3 dm. thick, terete, 12 m. high, straight; branches chiefly toward the top and forming a spreading crown, the main branches ultimately finely rebranched; wood moderately hard, dingy white except the yellowish brown central portion, odorless, with a distinct bitter taste; bark smoothish, brown; young twigs brown puberulent, finally glabrous. Leaves alternatingly scattered, numerous, all alike in size and shape, subchartaceous, glabrous, folded upon the upper surface, paler green beneath, drying brown, the caudate tips recurved, the entire margins subinvolute toward the apex, ovately lanceolate, obtuse at base, gradually tapering into the 1.5 cm. long apical portion which terminates in an obtusely rounded point, the lamina nearly 5 cm. long, 1.5 cm. wide below the middle; midvein bold beneath clear to the apical point, smooth and brown, grooved along the upper side; lateral primary pairs 9 to 11, parallel, with secondary ones between, nearly straight, very obscure, reticulations none; pedicels 5 to 8 mm. long, slender, blackish brown in the dry state, ultimately glabrate. Infrutescence from the leaf axils; stalks 2 to 3 cm. long, similar to the petioles, divaricate, only very shortly branched

toward the distal end if at all; fruits short pedicelled, 1 to 3–clustered, pendulous; calyx green and ovoid, glabrous, occasionally glutinous at the apex, 6 mm. long, nearly 5 mm. across the base, snugly covering the seed, the 5 obtuse teeth imbricately arranged, the outer 2 segments winged; wings crossed from the base, obtusely rounded at apex, narrowed toward the base, flat, oblanceolately oblong, about 7-veined, reticulations fine, pleasing red and appearing as if glutinous, the normal ones 3 cm. long, 7.5 mm. wide above the middle.

Type specimen 12071, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

This *Hopea* was discovered in red sticky clay of woods at 2000 feet elevation, on the summit ridge along the trail from Magallanes to Espana. Named after *Dr. F. W. Foxworthy*, who has recently revised our known Philippine *Dipterocarpaceae*.

The foliage of this species is practically the same as that of the following but the fruits are entirely different.

Hopea glutinosa Elm. n. sp.

Small tree; stem terete, 2.5 dm. thick, 10 m. high, branched toward the top only; wood rather hard, sourish to both odor and taste, whitish or darker toward the center; bark smoothish, mottled; main branches divaricate, numerously rebranched, forming bushy masses; twigs suberect, relatively short, at first dirty brown pulverulent, soon becoming glabrous and grayish in color. Leaves numerous, alternate, descending, rigidly chartaceous, dull deep green above, paler beneath, curing dull green or greenish brown, glabrous, somewhat folded upon the upper side, obtuse to obtusely rounded at the base, gradually tapering into the recurved 1 cm. long subcaudate apex which terminates in a very blunt or minutely emarginate point, the entire margins subinvolute at least in the dry state, nearly all alike in size and shape, the lamina 4 cm. long by 1.5 cm. wide below the middle, ovately lanceolate; midvein brown, raised upon the nether side, smooth and glabrous, boldly extending clear to the tip of the apical portion, sunken upon the upper side; lateral nerves about 9 primary pairs but with secondary ones in between, faint, parallel, ascending and slightly curved, strongly curved toward

their ends but not united, reticulations none; petiole 5 to 8 mm. long, slender, at first puberulent, finally glabrous. Fruits ample, sparingly branched, stalks from the lower leaf axils, pendulous; stalks pale green, glabrous in the fruiting state, 1 to 3 cm. long, sparingly and paniculately branched from the middle; fruit greenish, terete, ovoidly oblong or conically elongated, smooth and covered with glutin, nearly 1.5 cm. long, 6 mm. thick near the base, abruptly terminating into a slender usually recurved spinule; calyx lobes united at the base. dark green, snugly imbricate about the basal portion of the fruit, 5 mm. long, thick, glabrous, the outer 2 extended into wings, the wingless segments obtuse; wings 2.5 cm. long, 7.5 mm. wide above the middle, suberect and oppositely crossed, obtuse at apex, narrowed toward the base, 5 to 7-veined, finely reticulate, usually curved somewhat upon the outer side, yellowish green, brown when dry, parchment-like; ovary appearing as green varnished, with 2 green cotyledons.

Type specimen 12289, *A. D. E. Elmer,* Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Only one tree was found in a clay soil with a wet gravelly subsoil of wooded banks along the Pauala river at 750 feet altitude. The Visayan of north Sibuyan call it "Malungai."

This species is nearer to *H. pierrei Hance* than to the preceding and can readily be distinguished from *Beccari's* Borneo specimens in the leaf character alone; our glutinous fruits are much larger.

VATICA Linn.

Vatica obtusifolia Elm. n. sp.

A middle sized tree; stem 3 dm. in diameter, terete, straight, 12 m. high or higher, branched at the top only; wood hard, heavy, odorless and tasteless, the outer one third dingy white, the balance nearly avellaneus; the sap of the wood clear and somewhat viscid; main branches occasionally arising from near the middle but erect, numerously branched toward the ends; twigs very numerous, erect, forming dense bushes, glabrous, drying blackish brown. Leaves copious, alternate, elliptically oblong, the normal blades 5 cm. long, 2.5 cm. wide across the

middle, frequently smaller, obtusely rounded at both ends, entire, flat, ascending, rigidly coriaceous, much paler or lighter green beneath, curing dull green, glabrate or minutely scurfy or finely pulverulent; petiole 1 cm. long, when young pulverulent, ultimately glabrous and finely verrucose; midvein brown in the dry state, prominent beneath, nearly glabrous in the old leaves; lateral nerves of 7 to 9 primary pairs, tips anastomosing, relatively faint, reticulations fine and quite conspicuous from both sides. Inflorescence paniculately racemose, terminal or from the uppermost leaf axils, strict, erect or ascending, less than 1 dm. long, frequently only 5 cm. long, branched from the middle or toward the distal end; branches few and short, only sparingly rebranched, finely scurfy or pulverulent as is also the strict peduncle; pedicel straight and slender, 5 mm. long or much less, ashy gray pulverulent; flowers faintly but sweetly fragrant, dirty yellowish green on the outer organs; calyx valvate, 5 mm. long, 3 mm. thick, erect and tubular in shape, green and covered with a yellowish gray pulverulence, united toward the base; the 5 segments 3 mm. long, narrowly oblong or ligulate, obtusely rounded at apex, 1.5 mm. wide, occasionally some of them are smaller in size, erect at first, ultimately reflexed; corolla in the bud state tubular, imbricate but straight or nearly so, 1.25 cm. long, 3 mm. thick; segments pure white, very finely puberulent on the outer exposed sides, glabrous on the ventral surface, obtusely rounded at both ends, strap-like or narrowly oblong, 4 mm. wide, the inner side subincurved and glabrous along the outer edge; stamens 15, in 2 series, upon short somewhat flattened and base expanded glabrous filaments, 5, inserted upon the inner basal portion of the 5 petals, the balance in pairs of one above the other, inserted upon the basal portion of the calyx surrounding the ovary, the upper ones upon filaments twice as long as the lower ones; anthers oblong, 0.75 mm. long, all alike, the connective ending in a fine obtuse or mucronate point, somewhat flattened, ellipsoid from the side view, also glabrous; ovary one half immersed, the upper free portion conical and merely puberulent, toward the base distinctly 5-rugose, with 3 large ovules; style and stigma 1.5 mm. long, strict, the latter somewhat thickened or capitate.

Type specimen 12963, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911.

Discovered in a dry stony wooded flat at 250 feet altitude. Rare!

Vatica blancoana Elm. n. sp.

A small slender tree or shrub-like; stem 2 dm. thick, 8 m. high, branched from the middle or toward the top only; wood moderately hard, bitter, odorless, dingy or yellowish white; bark of the same color except the smoothish gray surface, rather easily separating from the wood; branches few and freely rebranched, relatively short. Leaves subchartaceous, alternatingly scattered, flat, horizontal or descending, slightly paler green beneath, curing brown, glabrous, entire, the bluntly or acute to acuminate apex somewhat recurved, base obtuse, oblong, the larger blades 15 cm. long, one third as wide across the middle; petiole subterete, stout, also glabrous, 1 to 1.5 cm. long; midvein very bold beneath, smooth and brown in the dry state; lateral nerves about 7 on a side, ascending, tips strongly curved but scarcely united, also prominent, reticulations very fine and equally visible from both sides. Inflorescence mostly terminal or from the uppermost leaf axils, suberect or laterally spreading, paniculately branched from the base, 1 dm. long and nearly as wide; main stalks flexible, sparsely pulverulent, alternatingly rebranched, reddish brown when fresh, the ultimate ones divaricate and subdichotemous; pedicels grayish puberulent, strict, less than 3 mm. long; flowers arranged in all directions, sweetly fragrant; calyx green, campanulate or cup shaped, 2 mm. long and nearly as thick, united toward the base, very densely grayish green puberulent, usually latericius gland dotted on the outside, adnate, the 5 segments sharply acute, straight even in anthesis; corolla in bud yellow, 1.25 cm. long, 4 mm. thick, tubular, strongly imbricate and twisted to the left especially toward the blunt apex, similarly cinereous puberulent on the outer exposed sides, 1.5 cm. long, 4 mm. wide, narrowly oblong or oblanceolately ligulate, apex roundly obtuse, in anthesis strongly reflexed or spreading and usually twisted, cremeus; stamens 15, composed of an alternating single with a double series, inserted upon the basal portion of the calyx surrounding the ovary; filaments short, flattened, expanded at the base, glabrous, that of the outer double series only one half as long; anther yellow, flattened, oblongish, 0.75

mm. long, the connective faintly apiculate; the free upper one half of the ovary conically pointed and finely puberulent, toward the base rugulose by the impression of the double stamens; style strict, glabrous, 1.5 mm. long; stigma capitate, apparently glandular.

Type specimen 13123, *A. D. E. Elmer*, Puerto Princesa (Mt. Pulgar), Palawan, April, 1911; also 12754 from the same locality.

Only a few trees of this species were observed in the great thinly wooded flat of rather poor red soil underlaid with gravel stones.

The calyx alone distinguishes it at once from *V. mangachapoi Blco.* which is represented by my number 5737 collected at Bauang, province of Union, Luzon. Dedicated to *Father Manuel Blanco*, an Augustinian priest and botanist.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. IV. Manila, P. I., April 20, 1912. Art. 75.

TWO SCORE OF NEW PLANTS

By

A. D. E. Elmer

EUPHORBIACEAE.

Baccaurea banahaensis Elm. n. sp.

A small erect tree, 5 m. high or shrub-like; wood hard, pale white; bark also hard, smooth, mottled; branches spreading and crookedly rebranched, the branchlets reddish brown, the green sparsely pubescent twigs ultimately glabrous. Leaves flat, submembranous, duller green above, glabrous, drying grayish green on both sides, entire, the slenderly acuminate or subcaudate tips recurved, alternatingly scattered toward the ends of the ultimate branches, base broadly obtuse, oblongish or the smaller ones broadly lanceolate, the larger lamina 17.5 cm. long and 6 cm. wide across the middle; midvein conspicuous and yellowish beneath, when young strigose but soon becoming glabrate; lateral pairs 6 to 9, ascendingly curved, similar in color and prominence, tips archingly united, cross bars and coarse reticulations relatively prominent beneath; petiole 1 cm. long, thickened at both ends, at first slightly hairy, ultimately glabrous. Fruits 1 to 3-clustered, lateral, shining smooth, yellowish white except the dark brown stigma, 3-celled, globosely elongated, ridged in the dry state; pedicels 5 to 8 mm. long, very sparsely strigose, bracteate especially toward the base.

Type specimen 9106, *A. D. E. Elmer*, Lucban (Mt. Banahao), Tayabas Province, Luzon, May, 1907.

Gathered in damp woods at 2000 feet altitude or at the wooded base of mount Banahao.

ICACINACEAE.

Urandra gitingensis Elm. n. sp.

A rather large tree; trunk terete, 6 dm. thick, 13 m. high or higher, branched above the middle; wood yellowish except the dingy sappy white outer portion, moderately hard, tasteless, with a distinct freshly dried fruit odor; bark thick, quite brittle, yellowish, roughened with lenticels, gray on the branches, green on the twigs; the branches numerously and crookedly rebranched. Leaves copious, alternatingly scattered along the occasionally zigzag twigs, ridged, ascending or the older ones horizontal, shining and very dark green on the upper surface, much paler or yellowish green beneath, curing somewhat unequally brown on the 2 sides, the entire margins curved upon the nether side, elliptic or obovately so, apex rounded, base broadly obtuse or subrounded, the larger lamina 12 cm. long by 7 cm. wide at the middle, frequently smaller, glabrous; midrib prominently raised beneath, minutely grooved along the upper side; lateral nerves comparatively obscure yet equally visible from both sides in the dry state at least, strict, ascending, 10 to 15 or more pairs, reticulations none; petiole leaving large scars after falling, averaging 3 cm. long, terete, yellowish green, dark brown when dry, also glabrous, stout. Infrutescence axillary, ascending, strict and rigid; peduncle also stout, terete, 2 to 4 cm. long, few and short branched at the ends; pedicels 1 cm. long, divaricately spreading, leaving conspicuous scars after falling, subtended by bract vestiges; fruits solitary or few clustered at the ends of the pedicels, sessile, subpendant, ellipsoid, short but prominently pointed at the apex, the base usually provided with the persistent calyx rim or cup, nearly 5 cm. long, dark dull green except the shining basal one third, its seed surrounded with a soft white sourish tasting meat.

Type specimens 12277 and 12076, *A. D. E. Elmer*, Magal-

lanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April and March respectively, 1910.

Both of these numbers were collected in heavy woods of rather damp moist soil along the Patoo river from 750 to 1750 feet elevation.

Leaves relatively broader than in the type of *U. hallieri Merr.* and apex always rounded, never pointed nor even acute. Other distinctive marks will no doubt be found when both flowers and fruits of the two species are known.

SYMPLOCACEAE.

Symplocos brandii Elm. n. sp.

Slender and erect tree; stem terete, 1.25 dm. thick or thicker, 10 m. high, its main branches mainly at the top; wood soft, sappy white, without odor or taste; bark smooth, greenish gray and brown mottled, reddish brown on the branches; branchlets divaricate, lax, rather numerous, glabrous. Leaves copious, alternate, chartaceous, horizontal or descending, broadly lanceolate or oblongish, the caudate tips strongly recurved, the base acute to subcuneate, darker green on the upper shallowly folded side, subglaucescent beneath, glabrous, the entire margins pellucid punctate, 5 to 8 cm. long, 1.5 to 2.5 cm. wide, curing yellowish green or flavo-virens especially on the nether side; midrib yellowish and raised beneath, sunken along the upper side; primary lateral pairs 3 to 5, the basal pairs much ascending, the upper ones divaricate, their tips more or less united 3 mm. beneath the edge, reticulations rather numerous and visible from both sides; petiole glabrous, yellowish in the dry state, conspicuously caniculate along the upper side. Infrutescence chiefly from the uppermost leaf axils, ascending, upon yellowish green 1.5 to 3.5 cm. long glabrous stalks; fruits sessile, few, scattered, ellipsoid or more cylindric in shape, 7.5 mm. long, 4 mm. thick, truncately rounded at both ends, smooth, nearly purplish black when fully mature, turning yellowish green while drying, with a stone-like seed.

Type specimen 12304, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Inhabiting a forested ridge of compact soil at 1250 feet altitude. The local Visayan name is "Magalas." Dedicated to *Dr. A. Brand.*

Its differential points from *S. adenophylla merrittii Brand* are: leaves larger, proportionally narrower and with longer petioles, spikes always glabrous and yellowish green, branchlets much slenderer, fruits by 2 mm. smaller in both dimensions, a slender tree at lower elevations, not a rigid shrub of high altitudes.

GNETACEAE.

Gnetum laxifrutescens Elm. n. sp.

A scandent and looping shrubby vine; stem terete, rather crooked and more or less nodulose, 3.5 cm. thick, numerously branched at the top; wood soft and flexible, porous, greenish white, without odor, bitter, with 3 to 5 large and coarse concentric rings; bark gray and brown mottled, more or less roughened with blunt obscure lenticels; branches numerous, divaricate, crooked, well interlaced, very flexible, conspicuously nodulose and jointed, smooth and brown, lenticelled except the green young portion. Leaves descending, shining deep green and folded above, duller and lighter green beneath, short ovate or ovately rotund, broadly and truncately rounded at the base, apex with a short acute point, entire margins wand-like or rugulose, black on both sides when dry, glabrous, rigidly coriaceous, 15 cm. long without the petioles, 12.5 cm. wide at the middle or a trifle below it, occasionally much smaller, opposite and well scattering; midvein stout toward the base, depressed on the upper side; lateral nerves 5 to 7 pairs, divaricate, branched toward their distal ends, reticulately united, even more prominent from the upper leaf surface, reticulations quite evident on both sides; petiole 2 cm. long, smooth or lenticelled when old, caniculate along the upper face, rather stout. Infrutescence pendulous from the larger branches, 1.5 to 5 dm. long, only sparingly branched, the nodulosely ringed and very flexible stalks dark green, the rings of the fruit bearing portion provided with a brush of short sordid brown hairs; pedicels reddish chocolate brown, glabrous, divaricate, 1.25 cm. long, wrinkled when dry;

fruits 1.5 cm. long, ellipsoid or obovoidly ellipsoid, rounded at apex, tapering at base, shining and similar in color.

Type specimen 12301, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Upon trees of middle size extending over the Sinuban creek at 750 feet altitude and in a region of dense humid woods. "Nonok" is the local Visayan name.

Allied to *G. latifolium Blm.* but really quite distinct from that species by its fruits and foliage.

MAGNOLIACEAE.

Talauma gitingensis Elm. n. sp.

Shrub; branchlets terete, crooked, rather long, lenticelled or with excrescences, the suberect young apical tips strigose. Leaves rigidly chartaceous, alternatingly clustered at the ends of the twigs, spreading in all directions, shining deep green above, paler beneath, margins entire and slightly revolute in the dry state, curing dull olivaceous, acute to acuminate toward the bluntly rounded point, base acute to cuneate, oblong or lanceolately oblong, 15 cm. long without the petioles, 4.5 cm. wide across the middle, frequently much smaller ones are intermixed; midrib equally conspicuous on both sides, glabrous, yellowish when fresh, straw brown when dry; lateral nerves 9 to 11 pairs, strict, oblique, tips usually ascending and interarching, very plain on both sides, reticulations very conspicuous and shining straw brown on the upper as well as on the lower surface; petiole glabrous, 1 to 1.5 cm. long, much thickened toward the base, plane along the upper side. Fruit terminal or subterminal, dark green, ovoid, 4 cm. long or less; pedicels dirty yellow strigose, 1 to 3 cm. long, crooked and curved, terete, 3 mm. thick; bracts thick, rugulose in the dry state, imbricate, 1.5 to 2 cm. long, the apical portion slightly divergent; seeds 7.5 cm. across or smaller, brown when dry, somewhat compressed, wider than its length, attached from the apex to the winged and irregularly grooved central axis.

Type specimen 12443, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Found on a forested ridge at 3000 feet altitude of the mountain whose name it bears.

Apparently this is the same as *Maximo Ramos* specimen from Zambales province, Bureau of Science number 5099.

THEACEAE.

Ternstroemia gitingense Elm. n. sp.

Small tree; stem terete, 1.5 dm. thick, 8 m. high, chiefly branched toward the top; wood soft, bitterish, odorless, white or reddish brown toward the center; bark yellowish gray, more or less lenticelled, reddish beneath the epidermis; main branches crookedly rebranched, lax, with ascending tips; twigs grayish white, glabrous, 5 mm. thick and obscurely angular in the dry state. Leaves terminal, in whorls of 5, horizontal or radially spreading, flat, thickly coriaceous, glabrous, curing dull avellaneus beneath, the upper surface usually tinged with red, when fresh dull deep green above and yellowish so beneath, entire, cuneate at the base, apex rounded and occasionally subemarginate, obovate or obovately oblong, 1 dm. long by one half as wide above the middle or larger; midvein conspicuous beneath especially toward the base, deeply channelled along the upper side, lateral nerves few and nearly obsolete; petiole stout, at least 2 cm. long, flattened and grooved along the upper side, thickened at the base, leaving large scars after falling. Fruits arising from between the leaves but not axillary, ellipsoid, 2 cm. long, glabrous and flavus, dehiscing in several parts from the apex; pedicels subpendulous, slender, terete, glabrous, 2.5 cm. long; calyx thick, persistent, shallowly cup shaped, the 5 segments imbricate and more or less united toward the base, 1.25 cm. across, 5 mm. deep, yellowish green and also glabrous; seeds 2, somewhat compressed, attached at the apex, covered with a crimson red mealy covering.

Type specimen 12397, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910: also number 12901 from Puerto Princesa (Mt. Pulgar), Palawan, May, 1911.

Discovered in moist rocky soil upon a steep densely wooded

ravine near a streamlet. The Visayan on Sibuyan island call it "Tapmis."

Our specimen is exactly matched by *L. Garcia's* number 40 from Baler collected in August of 1902. Like many other species in my collection it distinctly shows a distribution from Palawan to northeastern Luzon by way of Sibuyan.

MYRTACEAE.

Decaspermum grandiflorum Elm. n. sp.

A shrub, 4 m. high; wood brownish, moderately hard, odorless and tasteless, quite heavy; bark smooth, grayish brown, cinnamon brown on the branchlets; twigs lax, numerous, forming dense bushes, terete, the young portion appressed cinereous. Leaves numerous, ascending, submembranous, slightly folded upon the glabrous upper darker green and lucid surface, beneath densely punctate, in the young state sparsely strigose, oppositely scattered, the sharply acuminate or caudate apex recurved, broadly obtuse at the base, the entire margins slightly recurved in the dry state, broadly obtuse at the base, broadly lanceolate or ovately so, curing paler brown beneath, the normal lamina 5 cm. long, 1.75 cm. wide a trifle below the middle, those toward the inflorescence much smaller and with bract-like leaves intermixed; midrib very evident beneath, strigose at first on both sides, glabrous when old, the lateral nerved very obscure, reticulations none; petiole ultimately glabrous, 5 mm. long, slender, caniculate along its upper side. Inflorescence terminal or rather from the uppermost leaf axils; peduncle strict, ascending, cinereously strigose, the lower ones longer and occasionally rebranched, solitary from each axil, subtended by foliaceous bracts, those bracts subtending the upper or secondary branches much reduced; pedicel 1 to 1.5 cm. long or longer, strict, slender, sparsely cinereous when old; calyx urn shaped, subtended by 2 bracts, 6 mm. long, the basal united one half very finely appressed cinereous; the 5 triangular lobes pellucid punctate, glabrous except the very finely ciliate margins, ultimately reflexed, 3 mm. long and about as wide at the base; the 2 subtending bracts linear,

5 mm. long, 0.75 mm. wide, pellucid glandular, only sparsely strigose; petals pink at first especially toward the base, ultimately white, 1.25 cm. long, 7.5 mm. across the middle, rotately spreading, thin, densely glandular, ciliate along the edges mainly, obtuse at apex, broader so at base, veiny; stamens numerous, pink and ultimately white, glabrous; the filaments subequal and filiform, curvingly interlaced, nearly equalling the petals; anthers 0.5 mm. across, broader than long, ends emarginate especially the basal one, attached to the back; ovary imbedded; style slightly curved, nearly 1.5 cm. long, glabrous, thick, terete, bearing a minute stigma.

Type specimen 12057, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered in red turf soil or in gravelly soil of wooded banks along the Pauala river above 250 feet altitude.

Allied to *D. blancoi Vid.* based upon *Cuming* 801, yet very different in many characters but most noteably the large flowers.

LOGANIACEAE.

Norrisia philippinensis Elm. n. sp.

A burly appearing tree; stem 6 dm. thick, 10 m. high, with widely spreading main branches arising from the middle; wood moderately hard, yellowish white, without odor or taste; bark comparatively thin, grayish white, finely checked longitudinally and scaling in small plates, brown on the branches; young twigs minutely pubescent, terete, the older ones densely covered with yellowish gray lenticels. Leaves numerous, opposite, ascending, coriaceous, shallowly folded upon the upper deeper green and lucid surface, leaving ring-like scars after falling, oblongish or fusiform in shape or broadly lanceolate, glabrous, curing very unequally brown on the 2 sides, acute at apex, bluntly so at base, entire, 6 cm. long, 2.25 cm. wide at the middle; midvein dull reddish brown beneath, caniculate along the upper side; the lateral 5 pairs comparatively obscure, ascendingly curved, reticulations fine and nearly obsolete; petiole grooved, glabrous, 5 mm. long. Inflorescence erect, terminal, green and when dry with a dull yellow puberulence, 5 cm. long, paniculately branched from the

middle; peduncle strict, 2.5 cm. long, solitary, suberect; branches opposite, divaricate, also straight, rebranched from above the middle, subtended by very blunt bracts; flowers clustered toward the ends of the ultimate branchlets, with a faint fragrance; pedicel 1.5 mm. long, puberulent, bracteate at the base; calyx 1 mm. high, finely ciliate and puberulent on the back, the basal one-third united, the 5 lobes broadly rounded; corolla creamy white, 5 mm. long, the upper 1.5 mm. divided into 5 subelliptic or oblongish lobes, puberulent on the outside; stamens 5, alternating with the corolla lobes and inserted upon the throat; filaments whitish, filiform, 2 mm. long, usually curved, glabrous; anther flattish, 1 mm. long, elliptic, bilobed at the base, attached in the sinus; ovary ellipsoid, subglabrous or with a few short crinkled hairs; style 4 mm. long, whitish, terete, glabrous, curved and twisted especially in the younger state, terminated by a greenish thickened stigmatic portion.

Type specimen 12058, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

In compact turf soil along the Pauala river banks at about 250 feet altitude.

OLEACEAE.

Myxopyrum philippinensis Elm. n. sp.

Scandent by twining; stem terete, 2 cm. thick, flexible, occasionally branched but especially so toward the top; wood soft, odorless, sweetish, sappy white, with a relatively large pith; bark yellowish, shredded; branchlets quite rigid, forming interlaced masses, angular, dark green, glabrous, the ultimate ones slender and drooping. Leaves oppositely scattered, descending, glabrous, deep lucid green upon the upper usually folded side, much paler on the nether side, the obtuse or acute apex only slightly recurved, subchartaceous, curing brown, broadly rounded at the base, ovately oblong, the entire margins minutely involute when dry, quite variable in size, the larger blades 1.5 dm. long, 7.5 cm. wide at the midle or a trifle below it; midvein ridged beneath, the lateral pair of veins less prominent and arising from the base or very near it, reticulations coarse and rather plain beneath; pet-

iole stout, 1 cm. long, also glabrous, broadly flattened and shallowly grooved on the upper side, latericius in the dry state. Panicle lateral, 1 to 3 dm. long, profusely rebranched, cinereous or merely pulverulent when old, purplish brown; branches at right angles, usually subtended by sharp minute bracts; flowers subsessilely clustered toward the ultimate ends of the branchlets subtended by bracteoles; calyx short, acutely 4-lobed, faintly ciliate, green, united at the truncate base; buds globose, the 4 glabrous corolla lobes valvate, fleshy, 1.5 mm. long, oblongish, deciduous; stamens 2, upon a short common stalk, glabrous, included, the anthers cordately ovate and about 0.75 mm. long; ovary united, glabrous, obovately ellipsoid, terminated by 2 stigmatic arms, thick, 2-celled and 2-ovuled; fruits about 1 cm. long, ovoid, glabrous, 1-seeded.

Type specimen 12333, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

In thickets of light woods upon a limestone formation near the seacoast.

CELASTRACEAE.

Euonymus alatus Elm. n. sp.

A small tree; stem terete, 1.5 dm. thick, 7 m. high, branched from below the middle; branches widely spreading, laxly rebranched, the slender glabrous twigs green and subdeflexed; wood moderately hard, odorless and tasteless, pale reddish brown toward the center, somewhat burly; bark relatively thick, smooth, yellowish gray, orange red or yellow beneath the epidermis, otherwise reddish. Leaves leathery, descending, much lighter green beneath, flat, the acute or acuminate apex recurved, base obtusely rounded or merely obtuse, opposite, scattered along the twigs, oblong, the larger blades 15 cm. long, less than one half of that across the widest portion, the entire margins well curved upon the under side, glabrous, curing greenish brown, the upper surface usually ashy gray or subglaucescent; midvein pronounced on both sides; lateral nerves faint, very oblique or much ascending, 4 to 6 pairs, their tips more or less branched and obscurely united, reticulations coarse and more evident from the upper side; petiole

5 mm. long, glabrous, deeply channelled on the upper side. Fruit along the branchlets, mostly solitary, upon very short usually bracteated tubercles; pedicel terete, glabrous, glaucus in the dry state, 2.25 cm. long, subpendant; fruit hanging, 5- lobed and winged, obovoidly in outline, 2.5 cm. long, the apex deeply sunken and in the center projected into a sharp angular point, gradually tapering toward the base, shining and pale green; sepals 5, more or less united at the base, glabrous, greenish, relatively thin or membranous, rotund or broadly oval, entire, 5 mm. across, the 2 basal ones much smaller, all strongly curved upon the ventral side, imbricate; petals more whitish, of an equal number, oblong or elliptic, entire toward the broad base, margins fimbriate especially at the rounded apex, as long as the longer sepals; stamens 5, inserted upon the ovary disk; filament glabrous, 2 mm. long, compressed, strongly reflexed over the ovary disk, yellowish white; anthers 0.5 mm. long, nearly twice as broad, dehiscing along the upper edges, cells yellowish, connective brown; ovary disk nearly 4 mm. across, glabrous, minutely rugulose, at the middle bearing a 1 mm. long stout point or style with minute stigma.

Type specimens 12256 for fruit and 12485 for flower, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April and May, 1910.

Gathered from the wooded banks of the Agdamagan creek at 1000 feet altitude. The flowering specimens were collected on a humid forested ridge at the same elevation.

Allied to *E. javanicus Blm.* but the winged carpels in our specimens are entirely different. *E. sumatrana Miq.* is said to have fruits slightly longer than *Blume's* species and is considered a synonym.

BIGNONIACEAE.

Radermachera sibuyanensis Elm. n. sp.

An ascending tree; stem 10 m. high, 2 dm. thick, its main branches arising from below the middle, ultimately slender; twigs relatively short, few, thick, yellowish gray lenticelled; wood similar to maplewood, odorless, very bitter, moderately soft, red-

dish, white; bark brown, checked longitudinally, that on the branches yellowish brown. Leaves crowded toward the ends, ascending, alternate, 2 to 3-branched, 2 to 4 dm. long, the lower pair of branches occasionally again branched; peduncle proper nearly 1 dm. long, swollen at the base, terete, glabrous, the first internode about as long, the second one shorter and grooved along the upper side; petioles of the 2 lateral leaflets 5 mm. to 3 cm. long, glabrous, grooved, the terminal one also greatly varying in length but relatively longer; blades 1 dm. long and 3 cm. wide at the middle, the entire margins subinvolute, flat, ascending, rigidly coriaceous, deep green above, paler so beneath, glabrous, fusiform or gradually tapering from the middle toward both ends, curing dull brown on both surfaces; the terminal usually the largest; midrib nearly black when dry, bold beneath, caniculate above, glabrous; lateral nerves from 5 to 7 primary pairs, strictly oblique, tips united, very fine, usually with alternating secondary nerves extending from the submarginal line toward the midrib, reticulations very few. Inflorescence terminal or sublateral, 2 dm. long, sparingly paniculate; pedicels few to several cm. long, slender, glabrous as are all the other stalks; calyx boot 1.25 cm. long, glabrous, whitish, slit one half way down on one side, the 2 or 3 lobes broadly obtuse or rounded, veiny, 5 mm. across at the base, gradually expanding; corolla constricted toward the base and striate, nearly 5 cm. long, the saccate portion somewhat flattened and strigosely hairy on the inside, the tubular portion white; the 5 lobes pink or whitish, deep yellow about the throat, the lobes broadly rounded and subrotately spreading, 1.5 cm. across, the saccate tubular portion 1.5 cm. thick; stamens 4, in 2 unequal pairs, all included in the saccate portion and inserted upon the shoulder of the constricted portion; filaments whitish, curved, subterete, the longer ones 2 cm., the shorter 5 mm. less in length, somewhat constricted at the base of the connective in front and along its sides, the 2 parts divaricately spreading, oblong, 3 mm. long, laterally dehiscent; ovary 3 mm. long, glabrous but appearing grayish, subcylindric, at the base surrounded by a thick rim-like glabrous disk, gradually tapering into the slender glabrous 2.5 cm. long style; stigma dilated into 2 lobes which are 2.5 mm. long, 1.5 mm. wide below the middle, obtuse, ovately lance shaped, glabrous.

Type specimen 12060, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered on fertile wooded banks of the Patoo river at 500 feet altitude. Its local Visayan name is "Lanite."

GUTTIFERAE.

Garcinia sorsogonensis Elm. n. sp.

A laxly spreading shrub or a small tree; branchlets greenish, glabrous, terete, short branched. Leaves opposite, oblong or ovately oblong, rarely elliptic, rigidly coriaceous, glabrous, entire, margins involute and crinkled in the dry state, drying reddish brown, terminating into a sharp acuminate point, base broadly obtuse or rounded, the larger blades 15 cm. long by one half as wide across the middle or below it, frequently less than one half as large; midvein ridged beneath, also glabrous; lateral nerves 10 to 15, very obscure, divaricate, hard to distinguish from the secondary ones, reticulations evident; petiole thick, 7.5 mm. long, glabrous, shallowly grooved along the upper flattened side, dark green. Flowers solitary or few clustered from the ends of the branchlets, sessile, pistillate only; bracts 5, imbricate, the 2 outer 7.5 mm. long, the innermost ones much smaller, all glabrous and spoon shaped, rotund to orbicular, the exposed portions thick, more or less united at the base; ovary superior, subglobose, glabrous, the upper portion overcrowned by the thick circular stigma 4 mm. in diameter; young fruits glabrous, globose.

Type specimen 7187, *A. D. E. Elmer*, Palo, Leyte, January, 1906.

This same *Garcinia* was first noticed in the humid mountain range between Sorsogon bay and Matnog on the San Bernardino straits. Number 206 *C. V. Piper* from Surigao is very near our species.

SAPOTACEAE.

Sideroxylon acuminatum Elm. n. sp.

Middle sized tree; branchlets slender, terete, glabrous or

the young portion faintly scurfy of an umber color. Leaves alternatingly crowded toward the ends of the branchlets, thickly coriaceous, broadly lance shaped or pointedly fusiform, acuminate at apex, attenuate toward the base, the blade 1 dm. long by 3 cm. wide across the middle, the entire margins crinkled above the middle, blackish gray on the upper side, greenish gray beneath, glabrous; midvein stout, blackish brown beneath, also glabrous; primary lateral nerves 9 to 12 pairs, oblique, occasionally secondary ones interspersed, relatively very obscure, equally visible from the upper side, reticulations fine and quite evident; petiole 1.5 cm. long, at first pulverulent, ultimately glabrous. Flowers clustered in the leaf axils, broad; pedicels spreading, 5 mm. long, brown scurfy, subtended at the base by vestiges of bracteoles; calyx 5, imbricate, scurfy hairy, more or less united toward the base, ovately rotund, 3 mm. long, 4 mm. broad across the base; corolla segments 4 mm. high, united toward the base, oblong, rounded at the apex, thinner in texture, minute appendages in the sinus of the lobes, glabrous; stamens 5, opposite the petals and inserted on them below the middle; filaments 2.5 mm. long; anther as long, rotund or broadly elliptic, auriculately lobed at the base, dorsifixed from between the sinus, the sides widely opened in anthesis; ovary flattened, with tufts of hairs about the base; style columnar, 3 mm. long, faintly hairy, erect.

Type specimen 7904, *A. D. E. Elmer*, Lucban (Mt. Banahao), Tayabas Province, Luzon, May, 1907.

Instead of being *S. coriaceum Merr.* under which name it was sent out, it is more nearly related to *S. stenophylla Merr.*

ACANTHACEAE.

Staurogyne ophiorrhizoides Elm. n. sp.

Succulent herb; stems terete, pale green, solitary or few from the same root cluster, reclining toward the base, sparingly branched, yellowish puberulent. Leaves mainly horizontal, flat, submembranous, very deep dull green above, grayish green beneath, glabrous except the subolivaceus puberulent veins, entire, opposite, ovately oblong, obtuse at apex, acute to obtuse

at base, rather unequal in size, curing gray beneath and brown above, the larger blades 1 dm. long and one half as wide; mid-vein puberulent beneath, pulverulent above but soon becoming glabrate; lateral nerves 7 to 9 pairs, ascending and slightly curved, faint, cross bars and reticulations very obscure; petiole varying from 1 to 5 cm. long, slender, dull yellowish pulverulent. Inflorescence ascendingly curved, its few slender branches widely spreading, usually slenderly spicate and gracefully recurved in age; rachis greenish brown, puberulent or pulverulent, 5 to 10 cm. long, mainly solitary from the leaf axils and subtended by foliaceous bracts; flowers alternatingly scattered all along; pedicel 3.5 mm. long, faintly pubescent, subtended by a green linear subglabrous bract a trifle longer; calyx subtended by a pair of setaceous bracts about as long and faintly ciliate; the basal 1.5 mm. of the calyx united, otherwise dissected into 5 laciniate lobes, ciliate pubescent, gradually tapering to the sharp point, about 1 cm. long, green, bluntly rounded at the base; corolla 1.25 cm. long, tubular and gradually widened from base to apex, white with purplish brown streaks, usually somewhat curved, subglabrous on the outside, glabrous on the inside except the few hairs at the attachment of the stamens, veined; lobes 5, short and broadly rounded, about 2 mm. across; stamens inserted upon the corolla tube 2.5 mm. from the base, of 2 unequal pairs; filaments finely strigose, filiform or obscurely flattened, 4 mm. long for the shorter and 2 mm. longer for the 2 longer filaments; anthers apparently parted from the apex clear to the base, truncately oblong, usually curved, at least 1 mm. long; ovary glabrous, conically elongated, 2 mm. long, only one half as thick; style glabrous, 7.5 mm. long; stigma enlarged, pointed, 0.75 mm. long; capsule 5 mm. long, 1.5 mm. thick, elongated, obscurely compressed on the finely grooved sides, bluntly pointed at both ends, brown when dry, glabrous, 2-celled apparently and with minute brown seeds.

Type specimen 12364, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Discovered in moist clay mixed with rocks of a densely wooded gulch along the trail on the España side of the ridge at 1750 feet altitude.

ERICACEAE.

Vaccinium gitingense Elm. n. sp.

A low spreading bush; stem 5 cm. thick, 2 m. long, branched from the base; branches widely spreading, rigid, breaking with a snap, 1 to 2 m. long; wood hard, reddish brown except the thin sapwood, radially dotted, without odor or taste; bark coarsely checked longitudinally, dull gray; twigs terete, glabrous or the young tips faintly cinereous. Leaves rigidly coriaceous, ascending, flat, a trifle paler green beneath, curing unequally brown, the rounded basal portion entire, the sides obscurely crenately dentate, usually subinvolute, ovate to ovately elliptic, 2 cm. long, nearly 1 cm. wide below the middle, gradually acute at apex, alternate, densely scattered along the branchlets, reddish in the young state; midrib faint, the 3 to 5 lateral oblique pairs very obscure, reticulations obsolete; petiole 2 mm. long, relatively thick and much compressed, soon becoming glabrous, with a bud in the axil; calyx thick, cup shaped, glabrous, 3 mm. across, the basal portion united, the upper one half terminated into very sharply pointed 4 or 5 segments which are very finely ciliate along the edges; corolla deep red, broadly tubular, 6 mm. long, glabrous except the throat which is glaucus and occasionally bears a few hairs, the 5 narrow acute or acuminately pointed apex strongly recurved in anthesis, the tube ultimately separating into the segments which are gradually narrowed from the base to the apex; stamens 10, in 2 alternating and subequal rows, all inserted upon the base of the corolla and included by it; filaments villose, averaging 1.5 mm. long, thickened toward the base, those alternating with the segments a trifle longer than the other 5; anthers pale yellow, lanceoloid, 1.5 mm. long, dehiscing at the apex through 2 slender apical prongs, dorsifixed, less than 0.5 mm. thick toward the base; style terete, 6 mm. long, thick and fleshy, 2-pointed at the apex, bearing a granular flattish stigma; fruit globose, glabrous, at least 5 mm. in diameter, the circular apical portion covered over by the 5 persistent sharply pointed calyx teeth.

Type specimen 12555, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Only found in hot dry sand gravelly soil along the Pauala river bottom above 750 feet elevation. In all probability washed down from the summit region of mount Giting-giting. "Pagang-pang" is its Visayan name.

Distinct from *V. villarii Vid.* and *V. whitfordii Merr.* of our Philippine species, and from *V. coriaceum Hook.* of mount Kinabalu, British North Borneo.

GOODENIACEAE.

Scaevola merrillii Elm. n. sp.

A low lax shrub; stem 3.5 cm. thick, terete, usually more than one, branched from near the base, branches widely spreading; the twigs suberect or ascending, terete, smooth, gray, young portion faintly cinereous, at their ends bearing numerous leaves; wood soft, pale white, odorless and tasteless; bark smooth and grayish. Leaves horizontally spreading, coriaceous, flat, the obtuse tips recurved, paler green beneath, nearly glabrous above, sordidly tomentose beneath, obovately oblong to oblanceolate, coriaceous, slenderly cuneate to attenuate toward the base, the entire margins involute, the terminal or younger ones smaller, the old blades 1 dm. long by 3 cm. wide above the middle, drying unequally brown on both sides; midrib stout and prominent beneath, cinereous and shallowly grooved on the upper side toward the base; lateral pairs about 5 to 7, the basal pair nearly parallel with the edge, the upper ones oblique, the cross bars and coarse reticulations faint; petiole 1 cm. long, thickened at the base, with fine yellowish gray hairs in the axils, cinereous when young, shallowly caniculate along the upper side. Inflorescence axillary or from below the foliage, greenish except the white petals and yellow stamens, 1 dm. long or less; peduncle subterete, branched from above the middle, solitary, puberulent; branches dichotemous, subtended by green lance shaped bracts, with soft whitish short hairs in their axils, repeatedly branched; pedicel 5 to 8 mm. long, olivaceus pubescent, subtended by foliaceous bracts, 1 or 2-bracteate toward the distal end, at the base provided with fine white hairs and slightly thinner; calyx greenish, similarly pubescent, elongated or barrel shaped, 3 mm. long, 1.5 mm. long, thick,

truncate at the apex or merely apiculate; corolla whitish, inserted upon the calyx, nearly 1 cm. long, soft pubescent on the outside, villose in the tube, the apical one third lobed, the tube ultimately split down one side nearly to the base; lobes 5, about 3 mm. long, splitting truncately, oblong, the middle portion hairy on the back and apiculately exerted at the apex; the much thinner sides glabrous, folded upon the upper side in the dry state, more or less irregular and at the base even projected into a point or more; ovary imbedded, with 2 erect ovules; style fleshy, sparsely strigose toward the base, otherwise glabrous, terete, curved outwardly through the slit, not exceeding the corolla, terminated by a sparsely ciliate short lobed stigma; stamens 5, glabrous, strongly recurved through the corolla slit; filaments slightly thickened at the base, very slender, 4 mm. long; anther 1 mm. long, clavate, laterally dehiscent; fruit ellipsoid or barrel shaped, hairy, 5 mm. long, truncate at apex, pointed at base, purplish black.

Type specimen 12135[a], *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered in sand gravelly soil of the Pauala river flat at 750 feet altitude. Named after *Mr. E. D. Merrill* who has already described a few new species in this genus.

Distinct from *S. micrantha Presl* and *S. pedunculata mollis Merr.*

DILLENIACEAE.

Saurauia sibuyanensis Elm. n. sp.

A laxly spreading shrub; stem 7.5 cm. thick, branched from near the middle, 3 to 4 m. high, its branches repeatedly rebranched; wood sappy white, odorless and tasteless, with a large greenish pith; bark smooth, yellowish gray; twigs green, subglabrous, minutely lenticelled. Leaves subcoriaceous, much lighter green beneath, mostly horizontally spreading, flat or only shallowly folded on the upper side especially toward the recurved abruptly and sharply acute apex, the broadly rounded basal portion nearly entire, otherwise the margins serrately pointed, unequal in size, alternatingly scattered along the twigs, glabrous, curing very unequally brown on the 2 sides, the normal blades 2 dm. long and

8 cm. across the middle, broadly oblong; midvein prominent beneath, with 15 pinnate lateral pairs, the latter much ascending toward their ends, cross bars and reticulations faint; petiole 2.5 cm. long, furrowed along the upper side, otherwise subterete and subglabrous. Flowers axillary or in small lateral groups; pedicels very slender, finally nearly 2 cm. long, usually minutely bracteate toward the base and subtended by them at the base, very sparsely strigose, arising from fulvus pubescent very short and usually branched peduncles; calyx united toward the base, cup shaped or rotately spreading, glabrous or only finely puberulent especially along the margins, 5-segmented, obtuse, the lobes unequal in size, the upper or inner ones larger and with more membranous sides, 3 mm. long; corolla 5-segmented, spreading, white, glabrous, truncately oblong, 6 mm. long, only one half as wide, apex broadly rounded, entire or notched or even lobulate, broad toward the united base, membranous; stamens glabrous, reddish brown when dry, numerous, all inserted upon the base of the inner petals; filaments subterete, 2 mm. long, usually curved; anthers a trifle shorter, somewhat compressed, 0.66 mm. wide, truncate at base, distinctly 2-lobed at apex, attached on the back below the middle and usually bent at that point; ovary globose, 1.5 mm. in diameter, lanose, subtended by 3 subrotund and similarly hairy bracts, 3-celled; ovules numerous in each cell, densely clustered in roundish masses and attached to the axial placenta.

Type specimen 12535, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Found in red compact soil on shrubby creek banks at 500 feet altitude.

DICHAPETALACEAE.

Dichapetalum submaritimum Elm. n. sp.

Shrub; stem 5 cm. thick, 3 m. high, branched from below the middle; branches tough, quite rigid, rebranched and spreading; wood rather hard, sappy or dingy yellowish white, without odor or taste; bark brown, more or less warted or lenticelled; twigs when young cinereous or yellowish gray lanose. Leaves pale green, de-

scending, chartaceous, recurved at the obtuse to acute apex, obtusely rounded at the base, curing equally brown on both sides, entire, alternatingly scattered along the branchlets, elliptic, the larger blades 15 cm. long by 9 cm. wide, frequently smaller; midrib pronounced beneath, in the younger state cinereous but glabrate when old; lateral nerves 5 to 8 pairs, divaricate, slightly curved ascendingly, similarly hairy at first, finally smooth and brown as the midrib, reticulations obscure; petiole yellowish gray lanose, 1 cm. long, flattened and shallowly grooved on the upper side toward the base; ultimately becoming nearly glabrous. Inflorescence from the uppermost leaf axils, 5 cm. long or less, paniculately branched from the middle, all yellowish or yellowish gray tomentose, flowers rather dense toward the distal end of the branchlets, their stalks usually subtended by minute bracts; pedicel up to 2 cm. long, pulverulently woolly; the sepals nearly free, erect or ascending, thick, pulverulently woolly on the outside, glabrous on the inner, 5, narrowly oblong, 2 mm. long and one half as wide, obtuse at both ends, more or less unequal in width but not in length; petals glabrous, quite thick, as long as the sepals, free and clawed toward the base, obovate, 1 mm. wide above the middle, apex irregularly rounded or usually somewhat split down from the apex; stamens 8, ascending and centrally curved; filaments also 2 mm. long, relatively thick, glabrous, unequal in length, obscurely compressed, anthers introrse, at least 0.5 mm. long, roundly elliptic; ovary densely hairy or shaggy; style glabrous, strict, less than 1 mm. long, terminated into 2 short stigmatic arms.

Type specimen 12245, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Collected in compact soil of shrubberies in flats at nearly 250 feet altitude near mangrove extensions.

It differs from *D. timoriensis DC.* in having a different calyx, larger and less acuminate leaves.

NEPENTHACEAE.

Nepenthes graciliflora Elm. n. sp.

A tough sprawling suffrutescent perennial; stem solitary or

few from the same root, terete, 2 cm. thick, bendable; wood soft, with a large whitish pith, the inner portion reddish, the outer yellowish and covered with a thin red sapwood; bark dull brown, smooth, relatively thick; branches numerously rebranched, green, quite rigid, well interlaced, curved and drooping but with ascendingly curved tips, glabrous. Leaves also ascending, coriaceous, folded upon the upper side, paler green beneath, narrowly oblong or oblongish oblanceolate, smooth and glabrous, the blades varying from 1 to 2 dm. long including the 2 cm. long decurrent petiole base, entire, attenuate toward the base, acutely obtuse at apex, shallowly concave beneath, alternating and more or less crowded toward the ends of the shining green twigs, 3 cm. wide; midrib ridged along the nether side, extended into a tough tendril-like appendage which at the end is thickened and circinately recurved or pitcher bearing; when with a pitcher usually longer, stouter and doubly looped at about the middle; pitcher 1 dm. long, averaging 3 cm. thick, dull green and blotched with dark red, glaucusly purple on the inside toward the top, the oblique opening bordered by a finely striate much recurved thickened rim; the basal portion gradually enlarged and strongly curved, thick and striate; dry lid 2 cm. across, suborbicular or ovately so, blistery on its inner side, rather membranous. Inflorescence terminal, solitary, racemosely spicate, 3 or more dm. long, erect; rachis terete, when young umber brown puberulent, wearing glabrous, pale green; pedicels similar in vestiture, divaricate, promiscuously scattered along the rachis from below the middle, very slender, 1.5 cm. long; flowers odorless; perianth segments dark green but becoming deep red, 4, united at the base, in full anthesis somewhat reflexed, elliptic, roughened and faintly papillate, thick, prominently blistered on the inner side; stamineal tube green when young, when old dark red, thicker than the pedicel, 5 or more mm. long, dark brown as the segments in the dry state, glabrous, terminated by a flattened globose head; anthers bright yellow, sessile, elongated, vertically inserted upon the head, numerous.

Type specimen 12465, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Collected in shrubberies and forming dense masses in sand gravelly soil of the Pauala river bottom at 1000 feet altitude. Most of our Philippine pitcher plants inhabit subalpine or purely

alpine regions of humid moss laden woods, although in British North Borneo a small species is said to thrive along the seacoast. Recently the writer observed a large sterile species on mount Pulgar of Palawan. Some of its pitchers were a foot long and six inches thick!

Apparently quite different from *Blanco's* species.

MYRSINACEAE.

Ardisia oligantha Elm. n. sp.

A very slender tree; stem terete, 7.5 cm. thick, 7 m. high, branched toward the top only; branches divaricate, relatively short, sparingly but laxly rebranched, crooked or more or less curved, much thickened at the base; wood odorless and tasteless, whitish except the brown central portion, soft; bark dull brown, smoothish green and glabrous when young. Leaves curing green, subcoriaceous, mostly horizontally spreading, paler green beneath, glabrous, unequal in size, the acute apex somewhat recurved, acute to subcuneate at the base, the entire margins rugose, severally clustered in whorls, lanceolate to narrowly oblong, the normal blades 1 dm. long, 3 cm. wide at the middle; petiole minutely grooved along the upper side, averaging 1 cm. in length, also glabrous; midrib ridged beneath the lateral ones, about 7 pairs, ascendingly curved, tips running subparallel with the edge, scarcely united and minutely anastomosing, reticulations fine and a trifle more prominent on the nether side. Infrutescence terminal, drooping, varying from 3 to 5 cm. long, the glabrous stalks pale green and grooved in the dry state, solitary or occasionally very short branched; pedicels alternatingly scattered, usually curved, 1.5 cm. long, usually few clustered at the ends of the main stalk or branches, articulated yet subpersistent, glabrous, gradually thickened toward the distal end which bears the persistent calyx; calyx less than 5 mm. across, thick, the margins much thinner and very finely serrulate or apiculate, otherwise densely glandular punctate, the 5 segments united about the base and rather sharply and triangularly toothed; the obovoidly globose fruits dark green, 1.25 cm. long in the dry state and finely striate.

Type specimen 12310, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Collected in dry humus covered reddish soil of a forested ridge at 1500 feet of mount Giting-giting. "Betis" is the local Visayan name.

Related to *A. mindanaensis Mez.* and to *A. marginata* and *A. pardalina* of the same author.

Ardisia sibuyanensis Elm. n. sp.

An erect undershrub; stem terete, more or less crooked at intervals, 2.5 cm. thick, about 2 m. high, only few branched at the top or sometimes entirely unbranched; wood whitish, rather soft, with a large brown pith, odorless and without taste; bark smooth and grayish brown, the young twig portion nearly umber brown pulverulent. Leaves ascendingly spreading, flat, submembranous, nearly opposite, widely separated, shining on the upper glabrous surface, paler green on the subglabrous nether side, 3 dm. long by 1 dm. wide above the middle or across its widest portion, entire, apex acute or acuminate, obovately elongated, the basal portion narrowed and subpandurate, at the base obtusely rounded, occasionally very small or much reduced leaves either above or below the regular pairs; midvein prominently ridged beneath and usually umber pulverulent, glabrous ultimately, the upper flattened surface similarly pulverulent; lateral pairs 15 or more, divaricate from the base, ascendingly curved toward their tips, beneath similar to the midrib, the cross bars and reticulations quite evident from beneath and also pulverulent; petiole very thick, scarcely longer than 5 mm., at first umber scurfy, finally longer and glabrous. Inflorescence terminal, 1 to 1.5 dm. long, slender, suberect or recurved, also brown pulverulent, at the base subtended by a series of imbricate and acuminately pointed brown bracts; branches alternatingly scattered from below the middle, subtended by 3 mm. long linear bracts, flower bearing toward their distal ends; pedicels 5 mm. long, very finely puberulent, similar in color, subtended by bracteoles; fruiting pedicels 10 mm. long, deep red, terete, subglabrous, thickened toward the distal end; calyx cup shaped, 2.5 mm. deep, fully as wide; erect segments united toward the base, ovately obtuse, imbricate toward their bases, puberulent on the back, finely ciliate along the edges, quite thick and rigid, reddish gland spotted especially on the glabrous inner side; corolla

bud ovoidly elongated, 5 mm. long; petals imbricate but not twisted, 5, nearly free, glabrous, thick, reddish glandular on the inner side above the middle, the entire and glabrous margins rather sharp, oblongish, acute at apex, 6 mm. long, 2.5 mm. wide at or below the middle; anthers of an equal number and about as long, ovately linear and sloping to a fine point, upon a very short and flattened filament, inserted upon the basal portion of the petals and opposite them, introrse, somewhat triangular, the connective on the back blackish streaked or continuously glandular; ovary glabrous, ellipsoid, 1 mm. long; style 2.5 mm. long, terete, gradually tapering to the minute apex, also glabrous; fruits dark red, globose, only the base a trifle flattened, 1 cm. in diameter, subtended by the 5-segmented persistent reddish colored calyx.

Type specimen 12192, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Collected in moist gravelly soil of woods along the Sinuban creek at 750 feet altitude. "Lo-lumboy" is the Visayan name.

Only distantly related to *A. serrato-brevipetiolata Merr.*

Ardisia gitingensis Elm. n. sp.

A burly tree; stem 3 dm. thick, 10 m. high, its main branches arising from the middle; bark smoothish, yellowish gray; wood reddish, quite hard and brittle, bitter, odorless; branchlets widely spreading, crookedly rebranched, the glabrous twigs more or less crowded toward the ends, the ultimate ones slender and usually curved. Leaves chiefly horizontal, coriaceous, slightly darker green on the upper shallowly folded surface, curing avellaneus beneath, darker brown on the upper side, alternatingly crowded toward the ends of the grayish twigs and beneath the foliage, the entire margins subinvolute, broadly oblanceolate or obovately oblong, apex, obtuse, base also obtuse or subcuneate, glabrous, minutely punctate beneath, the larger blades 8 cm. long and 3 cm. wide above the middle; midvein prominent, the 9 to 13 lateral pairs of nerves very obscure; petiole 1.25 cm. long, glabrous, subcompressed. Inflorescence erect or nearly so, yellowish red except the pink corolla and deep purple anthers with yellow apices, spicately paniculate, 1 to 2 dm. long, rigid, the main grayish brown stalks striately ridged; branches alternatingly

scattered from the base, ascending, 5 cm. long or less, similar in color, rigid, rebranched toward the distal end; ultimate branches 1 cm. long or less, articulate and subtended by a ring of bract vestiges; pedicels glabrous, at least 5 mm. long, strict, subtended by similar bracteoles and also articulate, severally clustered at the distal ends of the ultimate branches, erect or ascending; calyx glabrate, the basal portion thick and united; the 5 segments fimbriate or finely ciliate along the much thinner entire margins, glandular punctate in the middle region, nearly flat, ovately rotund, 2 to 3 mm. across, imbricate, cup shaped but ultimately spreading; corolla united at the base, 5-lobed, glabrous, almost eglandular, thick especially the middle portion, the overlaid margins much thinner, elliptically oblong, 6 mm. long by one half as wide across the middle, obtuse or acute at apex, shallowly concave on the upper side; stamens 5, opposite the petals and inserted upon their throat; filaments glabrous, 1 mm. long, broadly expanded toward the base; anthers introrse, thick, obscurely compressed, 3 mm. long, 1.5 mm. wide below the middle, biauriculate at the base, subbasifixed, apex truncate and terminated by a sharp mucronate point; ovary superior, globose, glabrous, 1.75 mm. in diameter; style also glabrous, 5 mm. long, slender, corkscrew-like at the base, slightly thinner toward the minute stigmatic portion; young fruits flattened, glabrous, finely spotted.

Type specimen 12430, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Discovered on a wind swept forested ridge of well drained red soil mixed with boulders at 2750 feet of the mountain after which it is named. "Grasos" is the Visayan name.

The inflorescence and floral organs are distinctly different from *A. darlingii Merr.* collected by *Forester F. W. Darling* in the mountains of northern Luzon.

ANACARDIACEAE.

Buchanania reticulata Elm. n. sp.

A rather large tree; trunk 7.5 dm. thick, 15 m. high or higher, terete and straight; branches mainly at the top, crooked, comparatively short, the few ultimate ones quite rigid, glabrous;

wood moderately hard, only the thin sapwood white, otherwise reddish brown, light, fine to work, odorless and tasteless; bark dull grayish brown, when old scaling in small rather thick plates, light yellow beneath the epidermis, otherwise latericius. Leaves rigid, descending, lucid and much darker green on the upper more or less folded side, alternatingly arranged along the twigs, glabrous, entire, very unequal in size, narrowly oblong, the larger or normal blades 2 dm. long by 5 cm. wide at the middle, obtuse at apex, base subcuneate, drying greener on the upper surface; midvein very conspicuous on both sides especially so toward the base, smooth and glabrous; lateral nerves relatively faint, ascending and only slightly curved, about 15 pairs, their tips anastomosing, reticulations numerous and quite conspicuous beneath; petiole subterete or compressed, glaucus, glabrous, only toward the widened base grooved on the upper side, 3 to 5 cm. long. Inflorescence erect, terminal, heavy and somewhat succulent, limp, all the stalks glabrous and greenish, drying nearly black, paniculately branched from the base, 1 to 2.5 dm. long; the slender branches subtended by caducous small bracts, very shortly rebranched; flowers white or creamy white, odorless, more or less alternatingly clustered upon the distal ends of the short scattering branchlets; pedicels slender, not exceeding 5 mm. in length, subtended by glabrous and sharply acuminate bracts; calyx also glabrous, imbricate, 2.5 mm. long, erect, united at the base, ovate, acutely pointed, the inner ones slightly smaller and folded, deeply spoon shaped, 1.5 mm. wide below the middle, greenish; petals 3.5 mm. long, ovately oblong, gradually tapering to the acute or obtusely rounded apex, margins usually rolled upon the inner surface, conspicuously veiny in the middle portion, glabrous, white, with a small group of glandular thickenings on the veins upon the middle portion of the ventral side, free; stamen solitary, inserted upon an obscurely lobed much thickened ovary disk; filament 1.5 mm. long, glabrous, compressed at the base and gradually tapering from base to apex; anther subelliptic, 0.75 mm. long, dorsifixed; ovary glabrous and smooth, slightly oblique, 1.25 mm. thick; style terete, also glabrous, arising subterminally, 2 mm. long.

Type specimen 12334, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Found in moist humus covered rich soil of a densely forested flat at 750 feet altitude near the Pauala river. "Paho" is the local Visayan name.

Evidently most closely related to *B. florida Sch.*

Semecarpus glauciphylla Elm. n. sp.

An undershrub; stem 2.5 cm. thick, 3 m. high, branched from below the middle; branchlets few, quite rigid, spreading crookedly, the ultimate ones erect, the young portion very finely pulverulent, soon becoming glabrous; wood white on the outside, quite hard, without odor or taste; bark smooth, yellowish gray. Leaves ascending, alternatingly crowded toward the ends of the branchlets, quite rigid, flat or the sharply acute or acuminate apex recurved, the entire margins wavy, base obtuse, oblong, glabrous, smooth and deep green above, glaucus or subglaucus green beneath, the 2 surfaces curing very unequally in color, 2 to 3 dm. long, 6 to 9 cm. wide; midrib raised beneath, flat on the upper leaf surface; lateral nerves about 17 pairs, divaricate, tips ascendingly curved and usually united, glabrous, shining brown, reticulations relatively obscure; petiole very thick, 2.5 cm. long, caniculate, ultimately glabrous. Inflorescence terminal, paniculate, subglabrous or yellowish puberulent, 5 to 8 cm. long; pedicels 3 mm. long, more or less clustered from the distal end of the branchlets, puberulent, subtended by minute bracts; calyx 3 mm. high, a trifle wider across the 5 obtusely toothed top, the basal one-third much and abruptly constricted, finely canescent on the outside, rather leathery, the inner side glabrous and conspicuously purplish brown streaked; corolla segments or petals 3.5 mm. long, 1.75 mm. wide, glabrous, oblong, bluntly obtuse, similarly streaked or blistered; stamens alternating, also 5, glabrous, inserted below the ovary disk; filaments strictly ascending, 1 mm. long, compressed and tapering from base to apex; anther horseshoe shaped, less than 0.5 mm. across, attached at the broad sinus; ovary conically ovoid, short but densely yellowish hairy, subtended by a finely fringed disk; styles 3, divergent, 1 mm. long, olivaceus pubescent, bearing a much enlarged rugose or obscurely lobulate and recurved dark brown or nearly black stigma; ovule solitary, subpendant, lenticular; infrutescence nearly twice as large, erect, the stalks shining and dark green; fruits

also dark shining green, 1.5 cm. long, somewhat oblique, fleshy, set upon the thickened turbinate calyx.

Type specimen 12276, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Gathered in alluvial soil of dense woods at 750 feet altitude and along the Patoo river.

BURSERACEAE.

Canarium sibuyanense Elm. n. sp.

A small or middle sized tree; stem 1.5 dm. thick, 10 m. high, its main branches arising from the middle; wood white, moderately soft, odorless and tasteless; bark grayish white mottled, smooth, reddish brown beneath the epidermis; branches spreading, freely rebranched, dark brown pulverulent or puberulent, ultimately glabrous. Leaves alternate, horizontal or ascending, averaging 2 dm. long, 5 to 7-foliate, the basal pair of leaflets usually smaller; petiole stout, terete, grayish when old, when young sordidly pulverulent; leaflets descending, the acuminate to subcaudate apex recurved in the dry state, curing greenish brown, the rounded or obtusely rounded base occasionally inequilateral, elliptically oblong or the smaller ones ovately so, the larger blades 1 dm. long by one half as wide across the middle, glabrous except the nerves on the nether side; midrib stoutly ridged beneath, minutely so above, faintly puberulent when young; the 7 to 9 lateral pairs relatively pronounced beneath, divaricate, tips much curved and archingly united, also puberulent, the cross reticulations quite evident; petiolule at least 1 cm. long, the terminal one nearly twice as long, stout, dirty brown scurfy when young; stipule thick, adnate, terminated into a 5 mm. long prong. Spike ascending, divaricately spreading, solitary from the leaf axils, 1 to 2 dm. long, at first dull brown puberulent, soon becoming glabrous and gray, yellowish green; flowers scattered, usually single and more numerous toward the distal end, leaving large scars after falling; calyx thick, rigid, yellowish green, 4 mm. long, angularly terete, 3 mm. thick, pulverulent on the outside, with 3 broad and obscure lobes; petals creamy white, 3, about 4 mm. long, oblongish, thick and well separated above the middle, much thinner toward the

base, the exerted portion spreading, the outer or exposed portion scarcely pulverulent, 2.5 mm. wide; stamineal rim 1 mm. deep, glabrous except the ciliate rounded shallow lobes; fertile stamens 6, inserted on the cupular rim a trifle below the alternating lobes of the rim; filament glabrous, 1 mm. long, flattened and expanded toward the base; anther yellowish, ovately elongated, basifixed, 0.75 mm. long, obtusely rounded at apex; ovary subglobose, 2 mm. in diameter, finely hairy; neck shorter, thick, also puberulent, bearing a darker colored glabrous rather thick stigmatic disk; fruiting pedicel nearly 1 cm. long, thick, recurved, densely brown pulverulent as is also the rigid persistent 3-lobed calyx; nuts smooth, hard, elongate ellipsoid, 1.5 cm. long by 1 cm. thick, glabrous, greenish blue.

Type specimen 12225, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

It differs in a number of ways from *C. calophyllum Perk.* yet apparently closest related to it.

Canarium purpureum Elm. n. sp.

A tree of middle size; stem 2.5 dm. thick, toward 15 m. high, branched mainly toward the top; wood moderately hard, tasteless, with a greenish odor, sapwood whitish, brownish toward the center; bark dull gray, lenticelled and scaling in small irregular plates on the trunk; branches widely scattering, only sparingly rebranched or regularly so, the greenish glabrous twigs rather slender and less than 1.25 cm. thick. Leaves alternatingly scattered along the branchlets, ascendingly spreading, glabrous, varying from 1 to 3 dm. long, with 3 to 5 or even more pairs of leaflets; petiole subterete, 3 to 5 cm. long, brown when dry, obscurely thickened at the base; leaflets entire, oblongish or ovately so, similarly spreading, the abruptly acuminate or subcaudate tips strongly recurved, submembranous, shining on the upper slightly folded surface, 5 to 8 cm. long, 3 cm. wide, inequilateral, the acute base a trifle unsymmetric, much paler green beneath, drying brown on both sides; petiolule 5 to 8 mm. long, the terminal one twice as long, glabrous and blackish brown in the dry state; midrib conspicuous beneath, the 5 to 8 lateral pairs of nerves divaricate and ascendingly curved, tips barely united, reticulations equally visible from both sides; stipule none. Inflorescence ascendingly

spreading, glabrous, the stalks as well as the leaf petioles smooth and reddish, as long or longer than the foliage, the larger ones sparingly branched at about the middle, usually solitary from each leaf axil; flowers mostly in small groups, alternatingly scattered from above the middle or mostly crowded toward the distal ends of the branchlets; pedicels 5 mm. long, strict, glabrous, of the same color, subtended by minute and caducous bracts; calyx reddish, glabrous, 3 mm. long, nearly twice as broad across the obscure broadly rounded 3-lobed top, otherwise united into a cup; corolla pale yellow and reddish tinged, in the early state oblongish, glabrous, 1 cm. long, nearly one half as thick across the middle, the 3 lobes falsely united even in anthesis, minutely 3-toothed at the apical aperture, the edges straight and only slightly overlapping or imbricate; segments thick, rather veiny, oblong, obtuse at apex; stamens pale yellow, 5, united at the base, erect, included; filaments subequal or nearly equal, 6 mm. long, glabrous; anthers narrowly oblong, 3 mm. long, laterally dehiscent, basifixed, apex apiculate; ovary orange red, bearing 3 very thick and puberulent stigmatic lobes; infrutescence 1.5 dm. long, arising from the uppermost leaf axils, all the stalks and persistent calyx green; pedicel twice as long and as thick in the fruiting state; fruits 2.5 cm. long, 1.5 cm. thick, triangularly terete when fresh, angular when dry, elongate ellipsoid, with 3 cells but with only 1-seeded fruits, smooth, hard, of a light purple red, subtended by the 3-toothed persistent calyx.

Type specimens 12145 for flower and 12219 for fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March and April, 1910.

Both numbers were collected in woods along the Pauala river at 750 feet altitude. The former was called "Magosayong" the latter "Bolabog" by the natives or Visayan on Sibuyan. I have never seen a more pleasing red fruit in the Philippine Islands!

Only critically distinguished from *C. urophyllum Perk.* and *C. perkinsae Merr.*

EBENACEAE.

Diospyros rosenbluthii Elm. n. sp.

Large tree; trunk 7.5 dm. thick, 15 m. high or higher, terete;

main branches scattering from above the middle, relatively short and forming a thin elongated crown, very rigid, crookedly rebranched; wood white, moderately hard, odorless and tasteless; bark thick, reddish brown beneath the dull brown epidermis which scales in thin irregular plates; twigs rather numerous, terete, glabrous, lenticelled. Leaves coriaceous, descending, shining rich green above, slightly paler green beneath, shallowly folded on the upper side, especially so toward the acute to acuminate recurved apex, alternate, diverse in size, the largest ones nearly 2 dm. long by 6 cm. wide across the middle, oblong, the entire margins with a blackish callous, frequently much smaller, base obtusely rounded, curing unequally grayish brown on the 2 sides; midrib bold beneath, dark brown; the main lateral nerves grayish brown, relatively obscure, 5 to 8 pairs, oblique, coarsely rebranched toward their tips, reticulations quite evident; petiole thick, glabrous, nearly black when dry, widely and deeply channelled on the upper side, 1 cm. long. Inflorescence axillary, glabrous, 1 to 3 cm. long, the peduncle few flower bearing at or toward its end; pedicels as the peduncle thick, recurved, 5 mm. long; calyx thick, rigid, deeply cup shaped, glabrous, green, 6 mm. long, truncate or obscurely 4-apiculate; corolla cremeus, 1.5 cm. long, 4 mm. thick, tubular or only obscurely constricted toward the throat, glabrous; its 4 lobes strongly reflexed, subequal, short ovate, pointed toward the apex, about 5 mm. long; stamens about 28, clustered at the base of the corolla, very unequal in length and size, all strictly erect, sessile or short filamentous, glabrous, all included in the corolla, the connective nearly black, laterally dehiscent, walls of the pollen sac brown.

Type specimen 12501, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Gathered in a moist fertile alluvial soil of dense woods at 750 feet altitude, along the trail toward España and near the Patoo river. The Visayan call it "Hinla-hata." Named after its first collector, *Mr. R. Rosenbluth.*

Our leaves are smaller as a rule than those of *D. mindanaensis Merr.* In that species the calyx develops to a thick quadrangular column with strongly reflexed lobes. Forestry Bureau number 12878 collected on Samar is without that reflexed angular column, and in my opinion, it is the fruiting state of our new species here described.

Diospyros sibuyanensis Elm. n. sp.

A rather small tree; stem 7 m. high, 1.5 dm. thick, branched mainly toward the top; wood moderately soft, light, white, odorless and without taste, easy to work; bark grayish white mottled, nearly smooth or minutely checked longitudinally; branches divaricate, freely rebranched, forming a flattish crown, the very thin young ones brown and finely puberulent, otherwise gray and lenticelled. Leaves subchartaceous or coriaceous, descendingly curved, lucid on the upper and darker green surface, narrowly elongated or broadly lanceolate, glabrous, very unequal in size, the average ones 1.5 dm. long by 3.5 cm. wide below the middle, entire, obtuse or obtusely rounded at the base, toward the apex gradually tapering into the acuminate to subcaudate point, curing greenish brown on both sides; midrib straw brown when dry, ridged beneath, shallowly grooved beneath; lateral nerves relatively obscure, about 9 primary pairs but which alternate with rather conspicuous secondary nerves, oblique, coarsely branched toward their ends, equally visible from both sides, reticulations numerous and bold; petiole glabrous, less than 1 cm. long, quite stout, flattened above. Flowers rigid, solitary in the rigid calyx, erect, green, 7 mm. long at least, the 4 lobes united at the truncately squarrose base, subglabrous, the lobes ovately acute and margins toward the sinus curved upon the back; corolla white, nearly enclosed by the calyx, united below the middle, glabrate, only finely ciliate along the margins, 6 mm. long, the 4 lobes acutely pointed and recurved, bulged at the base; stamens 8, inserted upon the basal portion of the corolla, erect, included; filaments glabrous, dark reddish brown in the dry state, at least 1 mm. long, flattened, linear; anther basifixed, toward 2 mm. long, slenderly tapering from base to the finely pointed whitish apex; ovary sordidly pubescent, compressed globose, 3.5 mm. across; styles 2, each 1.5 mm. long, hairy below the middle, glabrate above it, at the top forked into short stigmatic arms.

Type specimens 12091 and 12090, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Discovered in compact well drained soil of secondary forests or woods bordering grassy glens at 750 feet altitude.

Distinguished by a number of minor differences from *D. curranii Merr.* (*D. reticulata Elm.*)

CONNARACEAE.

Connarus fragrans Elm. n. sp.

Scandent shrub or small tree; branches terete, glabrous. Leaves alternate, 5-foliate, occasionally 3-foliate, glabrous; petiole terete, glabrous, thickened at the base, 5 cm. long to the first pair of leaflets, the second pair 2 to 3 cm. apart; blades coriaceous, 1 dm. long by 4 cm. wide across the middle or a trifle below it, the smaller ones less than one half as large, entire, drying brown, obtuse, acuminate or more frequently caudate at the apex, punctate beneath, oblongish; petiole thick, 7.5 mm. long, the terminal one 3 times as long; midvein conspicuous beneath, brown and glabrous; lateral pairs 5, ascendingly curved, the basal pair less conspicuous, tips faint and reticulately united, reticulations very fine and evident from both sides. Panicle terminal, lateral or from the leaf axils, 1.5 dm. long, branched from the middle; peduncles glabrous, terete; secondary stalks puberulent and usually subtended by short and blunt similarly puberulent bracts, numerously branched especially toward the distal end, all short and densely umber pubescent; pedicels few mm. long, similarly pubescent, usually subtended by bracteoles; calyx also hairy, 2 mm. long; the 5 segments united toward the base, ascendingly curved, acute, thick, gland spotted; petals 5, ultimately free, ligulate, 6 mm. long, nearly 2 mm. wide, puberulent and glandular from below the middle to apex, the upper one half rotately spreading; stamens 10, erect, in 2 alternating series, their basal portion united into a glabrous cup about the ovary, 4 mm. long; the free portion of the 2 unequal series of filaments terete, sharply tapering, finely ciliate especially toward the end of the much larger series of 5; anthers suborbicular, 0.5 mm. across, versatile; ovary superior, globosely compressed, 2 mm. across, densely hairy; style 5 mm. long, stout, finely strigose, subterete, obscurely tipped at the apex and terminated in an enlarged flattened stigma; follicle luteus, when mature ellipsoid, 3 cm. long, one half as thick, smooth, apex

blunt, somewhat constricted toward the base, short woolly on the inside.

Type specimen 7269, *A. D. E. Elmer*, Palo, Leyte, January, 1906.

This species has not the congested appearance of *C. hallieri Merr.* and its mature fruits are at least different. Erroneously cited by *Mr. Merrill* as 7268.

Connarus carnosus Elm. n. sp.

A lofty and powerful tree climber; stems 7.5 cm. thick, terete, bendable, twining, looping, more or less branched all along; wood soft, porous, reddish except the whitish outer portion, without odor or taste; bark brown, lenticelled, reddish brown on the inner side; twigs rigid and short, forming dense bushes, grayish with lighter colored lenticels. Leaves alternatingly scattered, glabrous, 3 to 7-foliate, the uppermost ones usually smaller; petiole 3 to 5 cm. long, glabrous, dull reddish brown when dry, usually recurved from the much thickened base; leaflets curing brown, thinly or rigidly coriaceous, folded on the upper shining green surface, paler green beneath, the abruptly acuminate point recurved, base broadly obtuse or rounded, the callous entire margin minutely involute, the basal ones smaller and ovate or ovately elliptic, the larger ones 1 dm. long, 4 cm. across the middle and oblongish elliptic, imparipinnate, opposite or subopposite; petiolule thick, at least 5 mm. long, the terminal one upon a 1.5 cm. long rachis extension; midrib shining, prominent beneath, minutely grooved along the upper side; lateral nerves much less prominent, 3 to 5 pairs, ascending, slightly curved, quite plain on the upper surface, tips anastomosing, reticulations fine and numerous, equally visible from both surfaces. Inflorescence paniculate, 1.5 to 3 dm. long, ascendingly spreading, terminal or from the uppermost leaf axils, all the stalks green and covered with a fine ferrugineus pubescence; branchlets ascending, chiefly from the middle, ascending, relatively short, subtended by similarly pubescent bracts, the larger ones very shortly rebranched; flowers slightly fragrant and very showy; calyx pinkish, 3 mm. long, 5-segmented united at the base, somewhat fleshy, puberulent on the back and ciliate along the edges, glabrous on the inner side, the teeth rather gradually tapering from base to apex; petals 5, free, 2.5 mm.

wide, toward 1 cm. long, carnosus, oblong and with blunt ends, glabrous or only very finely puberulent especially along the edges; stamens erect, 10, fertile, in 2 series; the longer filaments equalling the corolla, rather fleshy, also carnosus, with few scattering tack shaped glands, subterete; the shorter ones alternating, only 2 to 3 mm. long, thinner, otherwise similar, united at the base with the longer filaments; anthers yellowish red, ovately orbicular, less than 1 mm. across, bilobed at the base, attached in the sinus; ovary hairy, short ellipsoid, 2 mm. long; style also flesh red, 3 to 4 mm. long, terete, puberulent or pulverulent, bearing an irregularly lobed stigmatic disk; fruits somewhat immature, elongated, obovoid or thickly oblanceoloid or tapering toward both ends, nearly stipitate at the base, 3 cm. long, slightly compressed and inequilateral, tinged yellowish when mature, with a single ovule, glabrous, minutely striate longitudinally at least in the dry state.

Type specimens 12069 for flower and 12305 for fruit, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March to April, 1910.

In forests at 750 feet along the Patoo river and on a ridge at 1000 feet altitude. The fruiting specimen was named by my Visayan companion as "Bago-bago."

As to our Philippine species it is nearest related to *C. hallieri Merr.*

RUTACEAE.

Evodia laxa Elm. n. sp.

Lax undershrub; stem 2.5 cm. thick, 1 to 2 m. high, branched from near the base; branches crooked, laxly rebranched, the twigs glabrous and suberect; wood soft, tasteless, slightly fetid, whitish with yellowish brown center; bark smooth, yellowish gray. Leaves membranous or subchartaceous, horizontally scattering, flat except the abruptly recurved or occasionally obtuse acute apex, deep dull green above, only a trifle paler beneath, drying brownish green on both sides, glabrous, finely pellucid punctate on both surfaces, entire, opposite, diverse in size and quite variable in shape, bluntly obtuse to subcuneate at the base, oblongish or obo-

vately oblong or even elliptic, the larger blades 15 cm. long and 5 cm. wide, frequently smaller; midvein yellowish brown beneath, prominently raised, yellow, glandular, grooved along the upper side; lateral nerves 7 to 9 pairs, subdivaricate, their tips archingly united, occasionally secondary ones intervening, reticulations quite evident especially from beneath; petiole varying from 5 to 25 mm. long, strictly ascending, shallowly grooved along the upper side, glandular along the lower side. Inflorescence in the terminal axils, 1 to 2 cm. long, suberect, subverticellately branched from above the middle; peduncle strict, striate, glandular and very finely puberulent, the short branches subtended by blunt sparsely cinereous bracts, the larger ones occasionally rebranched; pedicels 2 to 3 mm. long, subtended by similar bracteoles; calyx glabrous, rather broad at the base, yellow glandular, irregularly 4-lobed or obtusely apiculate, 2 mm. wide, only one half as high, persistent; petals 4, the 2 pairs equal in length but not in width, deciduous, 2.5 mm. long, glabrous except the beard toward the basal portion on the ventral side, ovately oblong or the inner 2 narrowly oblong, punctate on the outer sides; stamens 4, erect, inserted upon the thickened ovary rim; filaments 2 mm. long, glabrous, flattened, tapering from the base to the minute point; anther elliptically oblong, 0.75 mm. long, dorsifixed; ovary pale yellow, obscurely 4-lobed, glandular, 1.25 across, truncate at the top; style terete, 1 mm. long, strict, hairy toward the base, reddish brown as are also the filaments in the dry state; stigma slightly larger; fruit suberect, dark green, 3 to 5-pointed, glabrate, strongly veined on the sides, 6 mm. long by 3 mm. wide, elongate lenticular, more or less ridged along the edges, rounded at both ends, dehiscing along the upper suture, subtended by the persistent calyx, containing a shining black ellipsoidly elongated seed.

Type specimen 12562, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910; also number 12306 from the same locality.

Collected in red compact soil of moist woods or forests at 1250 feet elevation. The Visayan name for the latter number is "Alibot-bot."

As to our Philippine species it is nearest to *E. monophylla Merr.* but flowers greenish white instead of pink, leaves more membranous, inflorescence entirely different and with larger flowers.

Lunasia reticulata Elm. n. sp.

A strict shrub; stem 2.5 cm. thick or thicker, 1 to 5 m. high, terete, unbranched or nearly so; old wood odorless, bitter, pale white, rather hard and strong; bark yellowish brown, smooth, the young twigs covered with minute scurfy scales. Leaves mainly toward the top, ascending, chartaceous, flat, deep green and sublucid on the upper surface, much paler beneath, alternate, obovately oblong, margins entire, the average blades 3.5 dm. long, 1.5 dm. wide toward the apex, glabrous, curing grayish brown above and greenish beneath, apex abruptly acute or bluntly obtuse, cuneate at base, beneath minutely black punctate; midvein very stout and prominent beneath, flattened on the upper surface, dull brown in the dry state, densely sprinkled with yellowish brown scales especially beneath; the 15 to 20 lateral pairs of nerves oblique, strict, relatively bold beneath, tips interarching, reticulations numerous and conspicuous from both sides; petiole terete, green, much ascending, more or less swollen at both ends, 8 cm. long, also scaly. Inflorescence from the uppermost leaf axils, varying from 5 cm. to 3 dm. in length, ascending, only sparingly branched, yellowish green and densely yellowish brown scurfy, the spikes ridged; flowers odorless, sessile, clustered, alternatingly scattered, all the branches densely scurfy, umbellately scattered; buds globose, sessilely clustered at the distal ends of the branchlets, subtended by 3 very short and pulverulent bracts; perianth glabrous, hyaline except the midvein, oblongish when in full anthesis, acutely pointed, its sides usually rolled in upon the ventral surface; stamens 3, the glabrous filaments 0.25 mm. long, united at the base, otherwise divaricately spreading; anthers pale white, 0.5 mm. long, truncately oblong or ends slightly emarginate, dorsifixed, laterally dehiscent; fruits upon short thick stalks, dark brown, pulverulent, 1.5 cm. high, 2.5 cm. wide across the top when in full dehiscence, 3-carpellary, falsely united below the middle, truncate at the apex and with a rigid outwardly extended point, transversely ridged, dehiscing along the apical and ventral sutures, each cell 1-seeded, the blackish and shining seed surrounded by a bony endocarp.

Type specimen 12119, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Gathered in moist alluvial soil of a somewhat swampy wooded flat at 500 feet altitude.

At once distinguished from *L. amara* (*Blco.*) *Merr.* by the leaf reticulations.

Glycosmis greenei Elm. n. sp.

An erect undershrub; stem 3 to 5 cm. thick, 3 m. high, its branches arising from about the middle; wood dirty white or even yellowish toward the center, slightly fetid, tasteless, rather soft; bark very smooth and dull brown; branches few, lax and slender, scattering, even the young portion glabrous. Leaves minutely punctate, horizontal, the acute or acuminate apex recurved, glabrous, coriaceous, dark green above, much lighter green beneath, curing dull green on both sides, the very young leaves obscurely pulverulent and dull brown when dry, mostly ovately oblong or oblongish elliptic, base broadly obtuse, margins entire, the average blades 1 dm. long by 4 cm. wide across the middle or a trifle below it, alternate or appearing compound and 3 to 5-foliate; petiole 5 mm. long, thickened, furrowed above, glabrous, blackish brown when dry; midvein bold beneath, plane above; the lateral nerves obscure, strict, suboblique, about 7 to 10 pairs or even fewer, more or less united into a submarginal line 3 mm. from the edge, reticulations evident. Inflorescence 3 to 5 cm. long, erect, rigid, leaf opposed, strict; peduncle minutely pulverulent, brown, stout, angular or compressed, 1 to 3 cm. long; branches toward the distal end only short, thick, subtended by bracts, similar in vestiture; calyx 1.5 mm. deep, 2.5 mm. across the 5-dentate top, the basal two thirds united, densely reddish brown hairy on the outside, the teeth very shallow and rigid; petals cremeus, also 5, free, caducous, subequal, 3 mm. long, the sides more or less folded upon the upper side, oblong, glabrous, densely sprinkled with purplish black, obtuse at apex, truncate at base; stamens 10, included by the petals; filaments glabrous, much compressed and appearing petaloid, 2 mm. long, the basal portion subhyaline, otherwise spotted as the petals; anthers yellow, 0.75 mm. long, truncately ellipsoid, notched or emarginate at base, mucronate; ovary grayish, the sessile stigma very dark brown; fruits young, shining green, globosely compressed, 2-celled and 2-seeded.

Type specimen 12438, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Gathered in red soil packed between rocks on a forested ridge at 3000 feet altitude. "Mayoñg" is the Visayan name. Named after *Mr. Guy H. Green*, the other American on the island while I was there.

Related to *G. cochinchinensis* or *G. pentaphylla.*

FLACOURTIACEAE.

Homalium gitingensis Elm. n. sp.

Quite a large spreading tree; branchlets gray to brown, glabrous, usually covered with similarly colored minute lenticels. Leaves alternate, chartaceous, glabrous, entire, elliptically oblong or oblongish, shining avellaneus on the upper side when dry, duller and fumosus beneath, the larger blades 15 cm. long by 6.5 cm. wide across the middle or just below it, apex short and abruptly acute, base broadly obtuse or rounded, margins entire, glabrous; midvein conspicuous from both sides, brown beneath especially toward the base; lateral pairs 7 to 9, equally visible from both sides, ascendingly curved, anastomosing, finely and strongly reticulate on both surfaces; petiole blackish brown in the dry state, stout, 1.5 cm. long, glabrous, flattened and grooved along the upper side. Inflorescence suberect, axillary or terminal, 5 to 8 cm. long, usually 3-branched from the base, the middle or stouter spike occasionally short rebranched; peduncles and their branches densely sulphureus or cremeus lanose pubescent; flowers crowded along the ultimate branchlets, sessile or subsessile, soft in texture, the basal or outer organs yellowish villose; calyx 1 cm. long, the basal 3 mm. united, turbinate, hard and densely hairy; the 6 lobes ascending, strigose on both sides, flat, lance shaped, 7.5 mm. long by 2 mm. wide across the middle, acutely pointed at apex, midvein prominent and with some coarse lateral nerves; petals also 6, persistent, similarly strigose, acute at apex, flat, 5 mm. long, 1.5 mm. wide, subligulate, persistent, likewise with a conspicuous midvein and few lateral nerves, their sinuses provided with woolly glands; stamens about 25 or more in small groups opposite the petals and inserted upon their bases, erect; filaments

glabrous, very slender, blackish brown when dry, 2 to 3 mm. long or less; anthers orbicular, 0.33 mm. across, similarly colored; styles very similar to the filaments, severally grouped in the central mass, erect, also somewhat unequal; stigmas very small; ovary truncate and hairy on the top, encased by the united perianth bases; ovary 1-celled, severally ovuled.

Type specimen 12463[a], *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Found in reddish soil with a gravelly subsoil upon the banks of the Pauala river at 500 feet altitude.

Hydnocarpus ovoidea Elm. n. sp.

A small erect tree; stem 1.5 dm. thick, subterete, branched above the middle; wood dingy white, rather hard, odorless and tasteless; bark thin, yellowish gray or mottled, smooth; branches spreading, freely rebranched, when young densely fulvus tomentose. Leaves coriaceous, descending and the abruptly caudate apex strongly recurved, base obtuse, margins entire and subinvolute, folded upon the upper slightly greener side, glabrous, drying much lighter brown beneath, alternatingly scattered along the twigs, elliptic or oblongish elliptic, the larger lamina 1 dm. long by 4 cm. wide at the middle; midvein glabrate or nearly so, conspicuous beneath, dark brown, plane on the upper side; lateral nerves 4 or 5 pairs, much ascending and usually curved, also conspicuous beneath, tips not united, the cross bars and reticulations fine, nearly equally visible from both sides; petiole 5 to 8 mm. long, finely hairy, channelled along the upper side. Inflorescence axillary, suberect, 1 to 2 cm. long, fulvus pubescent; peduncle solitary, less than one half as long, bearing a few flowers toward the distal end; pedicel slender in the flowering state, thick in the fruiting, 5 mm. long, usually subtended by minute bracts; bud globose, 3 mm. in diameter; perianth soft hairy on the outer exposed sides, membranous, the 2 outer or basal ones smaller and triangularly ovate, the middle 3 broadly elliptic and 3.5 mm. long, the 5 inner ones orbicular, densely ciliate and about 2 mm. across; these subhyaline ones have a reddish brown appendage attached to them upon the ventral side at the base; appendages rotund, 1.25 mm. across, densely ciliate around the apical margin, sparsely so on the inner side, glabrous on the outer; stamens 5;

filaments glabrous, 1.5 mm. long, wide at the base and abruptly tapering to the finely pointed apex, reddish brown toward the base, yellowish white at the apex; anther broadly cordate, 0.75 mm. across, basifixed; ovary subglobose, 2.5 mm. in diameter, densely hairy; stigma sessile, stellately spreading into 5 narrowly elongated glabrous segments; fruits ovoidly ellipsoid, 1.25 to 2 cm. long, velvety dark brown or nearly black, with 3 seeds.

Type specimen 12410, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Collected on wooded limestone slopes near a mangrove swamp toward the seacoast at Ipil. The Visayan or natives called it "Lagtang."

Sufficiently distinct from *H. subfalcata Merr.* in the leaf and fruit characters.

Hydnocarpus quadrasii Elm. n. sp.

A stunted tree; stem 5 m. high, nearly 2 dm. thick; the main branches arising from the middle, crooked, freely rebranched; wood moderately hard and heavy, odorless, a trifle sweet, yellowish or sappy white; bark grayish white mottled, smooth on the branches, thinly checked on the stem, reddish beneath the epidermis; twigs very numerous, relatively short, subolivaceus tomentose when young, soon glabrate. Leaves chartaceous, copious, descending or the younger ones ascending, alternate, diverse in size, only the young ones sparsely and minutely strigose on both sides, glabrate when old, apex acuminate to subcaudate, base obtuse or obtusely rounded, the larger lamina 1 dm. long and nearly 4 cm. wide but most of them somewhat smaller, entire, the young ones curing unequally dark brown, the older ones lighter or grayish brown; midvein glabrous and reddish brown, the 6 pairs of lateral ones much ascending, all rather conspicuous beneath, the cross reticulations very minute and obscure; petiole less than 1 cm. long, at first puberulent, ultimately glabrous, obscurely grooved. The odorless flowers caducous, axillary; peduncle thick, 5 mm. long, solitary, suberect, short but densely fulvus tomentose, mostly terminated into very short branches or triads; pedicel 4 mm. long, rather thick for its length, fulvus felty, subtended by minute similarly puberulent hairs; buds flatly globose, 3 mm. across; calyx fulvus puberulent on the outer

exposed side, 3 mm. long, united toward the base, broadly elliptic, sides thin and hyaline along the margin, very deeply spoon shaped, obtuse at apex; petals 4, orbicular, 3 mm. across, very thin and white, strigosely hairy on the back and edges, concave on the ventral side, free; each at the base provided with a thicker reddish brown circular and much flattened appendage which is strigose on its ventral side and relatively long white ciliate around the edges; stamens 5, centrally located; filaments 1.5 mm. long, fleshy, thick at the base but soon terminating into the fine point which in anthesis is outwardly curved; anther 0.75 long, broadly oblong, bilobed at the base and attached in the sinus.

Type specimen 12085, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, March, 1910.

Here and there scattered in turf soil along the Pauala river at 500 feet. Named after *Mr. J. F. Quadras*, the original discoverer.

Critically related to my *H. ovoidea* and to *H. subfalcata Merr.* It is identical with number 214 *J. F. Quadras*, collected in 1901 at Surigao, Mindanao.

Casearia densifolia Elm. n. sp.

A suberect tree-like shrub; stem 7.5 cm. thick, 5 m. high, few branched from the middle; wood heavy, sappy white, without odor or taste; bark brownish gray, more or less lenticelled or checked; branches unbranched, bearing numerous leaves toward the end, obscurely zigzag from leaf to leaf, glabrous except the young glaucus portion, terete, slender. Leaves alternatingly scattered, spreading, curved or subfalcate toward the acute or acuminate apex, slightly inequilateral toward the acute base, entire, from 5 to 15 mm. apart, drying unequally brown on the 2 sides, the terminal ones usually smaller, 2.5 cm. wide below the middle, 7.5 cm. long, glabrous, broadly lanceolate or ovately oblong; midrib prominent below; lateral nerves 5 to 7 pairs, much ascending, tips reticulated, occasionally with few hairs in their axils, cross bars and reticulations very fine and evident from the nether side only; petiole 5 to 8 mm. long, glaucus, channelled more or less. Inflorescence in axillary dense clusters; flowers odorless, upon short and thick sessile tubercles clothed with minutely

ciliate bract vestiges; pedicel short or only 1 mm. long, glabrous; perianth 3 mm. long, campanulate, sûbglabrous, united toward the base, the 5 segments all equal, oblongish and obtusely tipped, imbricate; fertile stamens 10 more or less, arranged in an outer whorl; filaments 1.5 mm. long, pale white, somewhat expanded and flattened toward the base, strict, very finely hairy except at the distal portion; anthers more yellow, attached to the back, less than 0.5 mm. long and a trifle wider, ends truncately rounded and occasionally emarginate at the base; sterile stamens or staminodes in a central or inner whorl, as many and alternating with the fertile ones, 1 mm. long and bearing a brush of subhyaline hairs; pistils erect, slenderly elongated or gradually tapering from the base, 2 to 3 mm. long, the basal or ovarian portion glabrous, the neck sparsely hairy, stigma subglobose and covered with a waxy bloom.

Type specimen 12217, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

In woods along the sand gravelly banks of the Pauala river at 750 feet.

Casearia glauciramea Elm. n. sp.

A slender erect shrub; stem 7.5 cm. thick, 5 to 7 m. high, not straight, with a few main ascending branches arising from below the middle; branchlets ascending, unbranched, wand-like, slender, glabrous, characteristically glaucus white; wood soft, sappy white, heavy, odorless and tasteless; bark brown or gray mottled, smooth or lenticelled. Leaves alternatingly scattered along the twigs, mostly crowded toward the ends of the branchlets, horizontal, coriaceous, deep green on the upper more or less folded surface, only a trifle paler beneath, glabrous, curing blackish brown, ovately oblong, gradually terminating into the sharply acute or acuminate apex, base truncately rounded and a little inequilateral, the entire margins faintly recurved in the dry state, the upper ones gradually reduced in size, the lower blades 15 cm. long and 5 cm. wide at the base; midvein prominent beneath, with 5 to 8 ascending lateral pairs of nerves, their tips reticulated, rather plain from both sides, cross bars and reticulations quite evident from both surfaces; petiole 1 to 1.5 cm. long, densely glaucus, at the base with a rim-like thickening. Flowers suberect,

clustered in the upper leaf axils; pedicels puberulent, 1 to 3 mm. long, subtended at the base by a circle or whorl of short marcescent bracts; bud short ellipsoid; perianth erect, 3 mm. long, united toward the base, imbricate, finely puberulent on the dorsal side and along the edges, the oblong segments obtuse and whitish, stamineal disk short cup shaped, dark reddish brown and glabrous below the middle, the upper portion divided into 10 apiculate appendages whose tips are densely white hairy; fertile stamens also 10, alternating with the appendages and inserted upon the rim of the disk; filaments subequal, erect, 1.5 mm. long, whitish; anthers yellow, 0.5 mm. across, compressed, orbicular, emarginate at base; ovary ellipsoid, 2 mm. long, glabrous or only sparingly strigose; neck short, bearing an enlarged subcapitate stigma; fruits 7.5 mm. long, angularly ellipsoid, deep orange red, dehiscing from the apex toward base, the 3 carpels subpersistent, with darker red seeds, glabrous, subtended by the calyx.

Type specimen 12216, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, April, 1910.

Associated with the preceding species in sand gravelly soil of woods skirting the banks of the Pauala river at 750 feet altitude.

Apparently near to *C. fuliginosa Blco.* but ours is entirely glabrous and all branches characteristically chalky white. The fruits on this species is only one half as large as that on some of the Luzon specimens.

Homalium subscandens Elm. n. sp.

A subscandent shrub, 3 to 5 m. high; branches terete, smooth, brown or yellowish blotched, with much lighter colored lenticels, curved and repeatedly rebranched, the young tips glabrous. Leaves rigidly chartaceous, ascending, flat or nearly so, paler green beneath, sublucid above, glabrous, the entire margins subinvolute, alternatingly scattered toward the ends of the twigs, bluntly acute or obtuse at apex, base broadly obtuse, oblong, 8 cm. long, 3.5 cm. wide at the middle, curing dark brown or blackish, the lower leaves usually smaller; midvein prominent beneath, very plain on the upper side, glabrous, nearly black in the dry state; lateral nerves brown colored when dry, less prominent than the midrib beneath, about 6 pairs, oblique, tips anastomosing,

reticulations very numerous and bold from both surfaces; petiole very short or 3 mm. long, thick, glabrous, black, flattened and grooved on the upper side. Inflorescence terminal, ascending, usually of few spikes arising from near the base; spikes slender, 4 to 7 cm. long, soft yellowish gray pubescent, flower bearing from near the base; flowers odorless, soft, yellowish brown, scattered in small alternating groups; pedicels 2 to 3 mm. long, pubescent, usually subtended by bracts; calyx turbinate, 8 mm. long, the basal one third tubular and similarly covered with grayish white hairs, rather thick and rigid, also hairy on the inside; perianth of 10 segments, outwardly recurved, linear, cinereous pubescent, the longer series of 5 less than 1 mm. wide and 4 mm. long, the alternate series only one half as wide and a trifle shorter, apex rather blunt, at the basal inner side provided with glabrous glands; stamens 5, inserted upon the throat and between the gland of the larger segments; filaments 4 mm. long, expanded toward the base and hairy up to the middle, filiform and glabrous toward the apex; anther subglobose or truncately ellipsoid, less than 0.5 mm. across; style 3, somewhat shorter than the filaments and more rigid, outwardly curved, gradually tapering from the rather thick base to the sharp stigmatic portion, cinereous; ovary mostly imbedded or enclosed by the calyx tube, the upper portion hairy.

Type specimen 12442, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910.

Collected in red sticky soil mixed or packed between stones on a forested ridge at 3000 feet altitude. Very rare!

Only distantly related to *H. panayanum Vil.*

Flacourtia magallanense Elm. n. sp.

A rather small tree; stem 2 dm. thick, 10 m. high, branched from below the middle; wood not hard, yellowish white, tasteless but with a sort of greenish odor; bark yellowish gray, smooth or checked, reddish brown beneath the epidermis; branches numerously rebranched, forming a dense crown, light gray, glabrous. Leaves alternatingly scattered along the branchlets, chiefly horizontal, subchartaceous, folded upon the upper lucid green surface, their acute tips recurved, the subcuneate base slightly inequilateral, entire, glabrous, of a dull lead color on both sides when dry, oblong, the larger blades 1.5 dm. long, 5 cm. wide

across the middle or a trifle above it; midvein prominent beneath, flat or minutely grooved above; lateral nerves about 6 pairs, much ascending, also bold beneath and very evident above, coarsely branched toward the ends, smooth and glabrous; reticulations numerous and conspicuous on both sides; petiole less than 1 m. long, glabrous except the olivaceus strigose hairs in the deep channel. Fruits suberect, axillary, hard, green, glabrous, subsessile or upon very short green stalks, mostly solitary, ovoidly globose or somewhat obscurely flattened or trigonous, 1.5 to 2 cm. across, apparently 2-celled and wtih 2 compressed crustaceous seeds.

Type specimen 12476, *A. D. E. Elmer*, Magallanes (Mt. Giting-giting), Province of Capiz, Island of Sibuyan, May, 1910; also numbers 12323, 12079 and 12142 from the same locality.

All of these specimens were collected in good soil of moist woods or forests from 750 to 1500 feet elevation.

Apparently nearest to *F. inermis Roxb.* Possibly it is a *Myroxylon Forst.*, and it also has the facies of a *Cyclostemon Blm.*

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